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Evolution of the Lynite Laboratories

Plant Notable for its Scope and Extensive
Equipment for Conducting Research and
Experimental Work in Aluminum Alloys

BEGINNING in a small way, the Aluminum Castings Co. in 1915 established at Cleveland a laboratory for special research and the development of aluminum alloys, particularly those adaptable to the automotive and airplane fields. From a single room in charge of one man it has expanded until it is an institution termed the Lynite laboratories, occupies 22,000 sq. ft. in a brick building 75 x 213 ft., and is notable because of its layout and comprehensive organization. Over part of the building is a second story which is devoted to the administrative offices of the various sections. The labora-

practice to secure the desired results. The comprehensive scope of the laboratories is shown in the reproduction of the organization chart. The scope of the plan has met with much favorable comment from research authorities in the United States, and Dr. Walter Rosenhain, vice-president of the Institute of Metals of Great Britain, recently urged the adoption by the British non-ferrous metal industries of a research plan identical to that of the Lynite laboratories, and it is announced that the British Government has just voted to place at the disposal of industrial research £1,000,000 sterling.



The Channel Construction in the Floor of the Dynamics Laboratories Provides a Bed Plate Practically the Length of the Room. Floor space is conserved by the overhead location of some of the apparatus, and an Alden absorption dynamometer for rear axle tests is shown in the foreground

tory staff includes about 100 trained specialists. In addition to the space of the laboratory building, a large section of the company's new aluminum foundry in Cleveland is being equipped for use as an experimental foundry. This foundry, and the one being erected in Detroit, by reason of their size and complete equipment, will be notable additions to the aluminum foundries of the country. They will have a combined capacity of 120,000 lb. of castings per day.

The general organization of the laboratories is laid out to include research along purely scientific lines in the arts of alloying and fabricating non-ferrous metals, the adaptation of this scientific knowledge by means of experiments and development methods, and the scientific control of foundry

The alloy generally used as a standard in this country for making motor car castings has a copper content of about 8 per cent, and 92 per cent aluminum. The castings made from this alloy have a tensile strength of from 14,000 to 20,000 lb. per sq. in., and an elongation of about 1.5 per cent. In addition to this alloy a number of other alloys consisting of various percentages of aluminum, copper and other metals, have been made and standardized. The tensile strength, hardness and other properties of the alloy vary accordingly. In each case, however, the question of the ease of casting, nature of the design and use of the finished product determine the alloy to be used.

Under the plan of conducting the laboratory work each member of the staff is free to express his ideas,



In the Foreground in the Metallographic Laboratory Is a Precision Potentiometer. Having a Sensitiveness of 0.0000001 Volt. The microstructure of aluminum alloys is studied through the metallographer's camera in the left-hand corner. The specimen is polished and etched and then placed on the stage of the microscope. The carbon arc lamp on the bench at the left is for illuminating the object

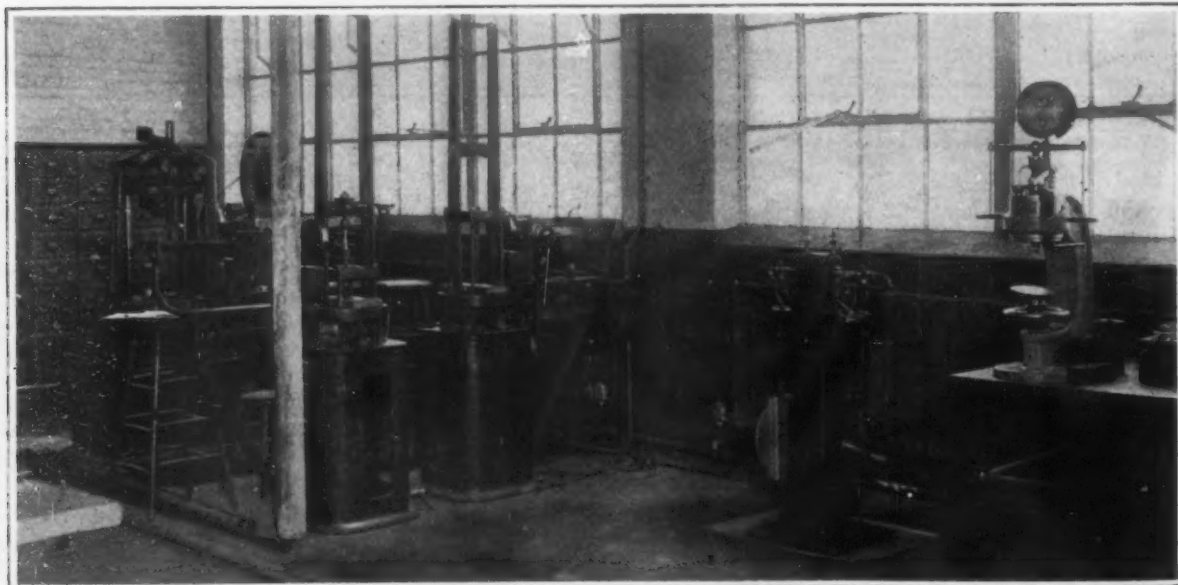
not only in respect to his particular work, but also in respect to the operation and development of the entire laboratory organization. These suggestions are collected, sorted and classified. For a suggestion to receive the attention of the laboratory staff it must become a formal problem, but before it can become a formal problem it must pass the critical scrutiny of a problem committee, which includes the heads of the various sections of the laboratories, as well as executives of the company. After an idea is made a formal problem, its status is determined. All existing information bearing on the problem in any way is systematically collected, classified and studied. When this has been done, the problem may be thrown into the discard. If not, it is labeled "urgent," "important" or "common" and assigned to its particular section or sections for investigation.

The laboratory organization is divided into three main divisions: Research, development and technical standards divisions. The research division, which works in close co-operation with the other divisions, is divided into six sections, special research, metallurgy, metallography, chemistry, physics, and tests

sections. The metallurgical section is for the investigation of foundry melting practice, and the study of the processes of alloying, refining and purification of metals and alloys. Its work includes all general metallurgical research not included in the special research field, and a broad study of alloy development.

The metallography section devotes its attention to the determination of the constitution of metals and alloys and the study of the relation of their thermal and mechanical treatment to their constitution and physical properties. The equipment in this section includes a metallographic camera, a large camera for photographing objects at their actual sizes, electric furnaces a Leads & Northrup Co. precision potentiometer for temperature measurements of high precision in heat treating and cooling curve work, and apparatus for the determination of the co-efficiency of thermal expansion and the thermal conductivity of alloys.

The work of the chemistry section, provided for the analyses of materials and the maintenance of standards and particularly of alloy development, is divided into two distinct phases, tests and research.



Tests of Fatigue Are Made in the White-Souther Stress Machine at the Right. At the left are three tensile testing machines and on the bench at the right of the White Souther machines are a Brinell testing machine and a scleroscope

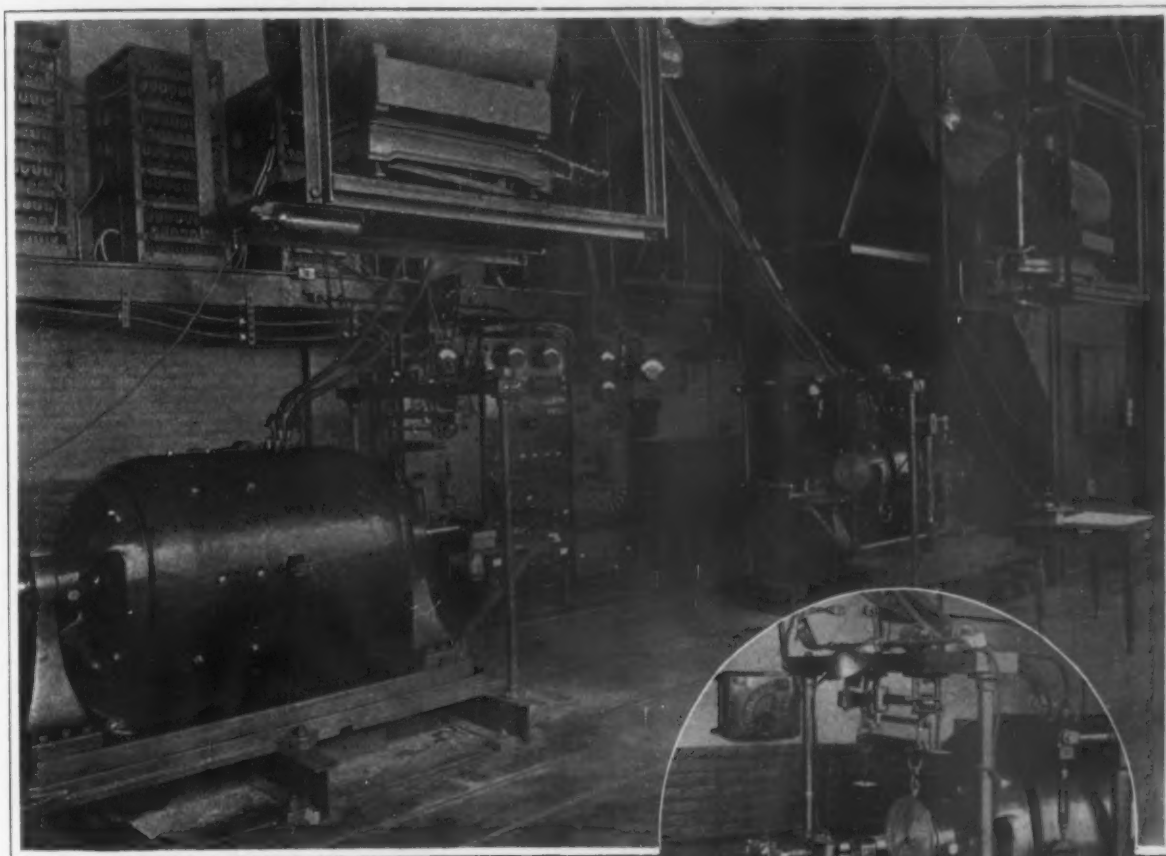
This section is provided with two laboratories, one for testing and one for experimental work. There is equipment for the analyses of aluminum alloys, bronze and other metals, and in addition to routine work connected with research, such problems as corrosion and the action of alloys under new conditions such as heat treating, are taken up. The chemical laboratory for testing is provided with complete facilities for small scale research, these including furnaces, hot plates, a blast blower's bench, balance room, fume cabinet, etc. The experimental and development laboratory is the connecting link between the chemical laboratory and plant production. This is equipped with meters, tools and various apparatus to meet the needs of industrial research work.

Appreciating the necessity for physics research to round out the scientific investigations of the

pots are used with the furnaces. A nitre bath is provided for heat treating.

The test bars used are 2 in. in length and $\frac{1}{2}$ in. in diameter, and conform practically in size to the standard A.S.T.M. steel test bar, but the bars are used without the test length being machined. The test bars are cast two in a mold, metal being fed into each section of the mold through two risers.

The work of the physical testing laboratory is both routine and special. Under routine tests are classed the usual tension tests by which the yield point is determined, as well as the maximum stress and elongation. Other properties determined are the reduction of area, elastic and proportional limits and modulus of elasticity, all of which have an important bearing on the use to which the alloy is put. Four tensile testing machines are provided having a capacity of from 10,000 to 200,000 lb., thus



A Close View of the 200-Hp. and 500-Hp. Dynamometers and Their Respective Control Panels on the Switchboard

In Circle, the Weighing System of the Dynamometers. The scale reads the number of pounds of torque at a 63-in. arm, and makes horsepower calculation easy

laboratories a separate section was created to study the various problems from this point of view. The equipment consists of volt meters, potentiometers, ammeters, condensers, galvanometers, resistance standards, Wheatstone-bridges, thermometers, telescopes and apparatus necessary for making measurements. The work of this section is essentially research and calls for special apparatus, which is built as needed.

The tests section includes a test bar and experimental foundry and a physical testing laboratory. The work of the foundry consists in the production of test bars, by which the properties of new alloys are studied, and in the study of the effect of variation in melting and casting practices. Two oil-fired crucible furnaces are used for melting, and two gas-fired furnaces, one for high temperatures and one for low temperatures, are available for experimental heat treatment. Either iron or graphite

insuring tests over a wide range of work. The 50,000 lb. machines will take a test bar having a maximum strength of as high as 250,000 lb. per sq. in. The 200,000 lb. testing machine now being installed will be used in making tests on large aluminum castings. Compression, or the ability of material to resist "push" is also measured in the tension testing machines.

The physical testing laboratory contains equipment for making the Brinell and scleroscopic tests for hardness and equipment less commonly used for making other tests. One test of considerable importance in certain cases is the transverse test. The standard bar is supported at two points approximately 12 in. apart, and a load applied in the center. The testing machine weighs the load applied and measures the deflection of the test bars.

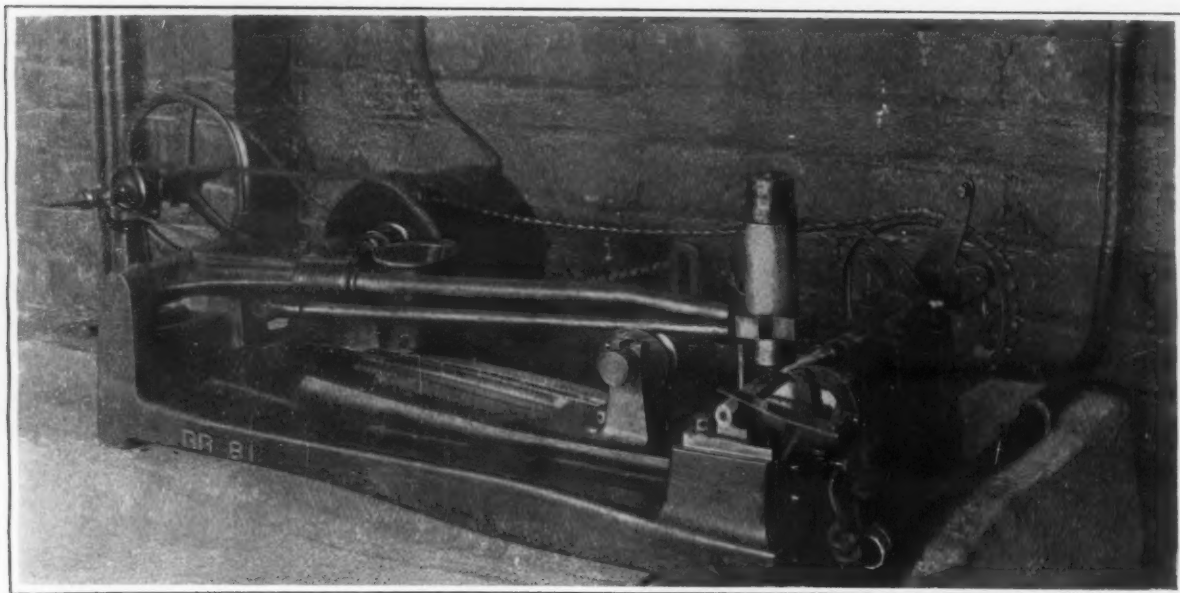
The special tests include fatigue and impact tests, as well as tests on fabricated parts. In the impact field the Stanton repeated blow machine is of particular interest. It is an English machine, made by the Cambridge Scientific Instrument Co., and tests the ability of material to withstand repeated blows. The test bar, $\frac{1}{2}$ in. in diameter, is supported by knife edges $4\frac{1}{2}$ in. apart. A hammer weighing approximately 3 lb. is dropped upon the center of the bar, which rotates so that the second blow hits 180 deg. from the first. These blows are repeated at the rate of 100 per min. The distance of the fall of the hammer may be varied up to 4 in. so that the test bar may be broken in one blow or require a week or two weeks or longer of continuous operation before fracture takes place.

Another testing machine used is the Charpy single-blow impact machine, the application of which to non-ferrous metals is new. The machine is of French design, but is built in this country by Sauveur & Boylston, Cambridge, Mass. A square bar, about $\frac{3}{8}$ in. section, notched at the center, is supported over a 2 in. span, and a falling pendulum fractures the test bar in one blow. The energy absorbed is measured by the difference between the original energy of the pendulum and the energy remaining after the blow, which is indicated by the

every sample has a laboratory number. A record of the samples is kept by means of a card index system, there being three cross indexes for alloy sample, number and uses for the material. In another rack are kept 200 special alloys for use in experimental foundry work.

The development division includes the second group of workers. It is their duty to utilize the knowledge of science and by experimentation to put new products or processes into production. However, the relation between this division and that of pure research, as well as technical control, is very close and often overlaps. The division is divided into six sections—dynamics, general engineering, automotive engineering, permanent mold, sand castings and special development sections.

The dynamics laboratory occupies a room 25 x 100 ft. Its work consists of theoretical investigation of internal combustion engines, and in particular the study of parts made of aluminum alloys. The principal equipment of this laboratory consists of three Sprague dynamometers, one rated at 400 hp. at 1400 r.p.m., one at 200 hp. at 1350 r.p.m., and one rated at 100 hp. at 1200 r.p.m. In installing this equipment, instead of providing the customary bed plates, a special channel construction was embodied in the concrete floor, to which the dynamometers



Stanton Repeated Blow Impact Machine Which Tests Material to Withstand Repeated Blows. Sometimes a test bar is kept in a machine two or three weeks before it is broken, being subject to continuous blows during that time at the rate of 100 per min.

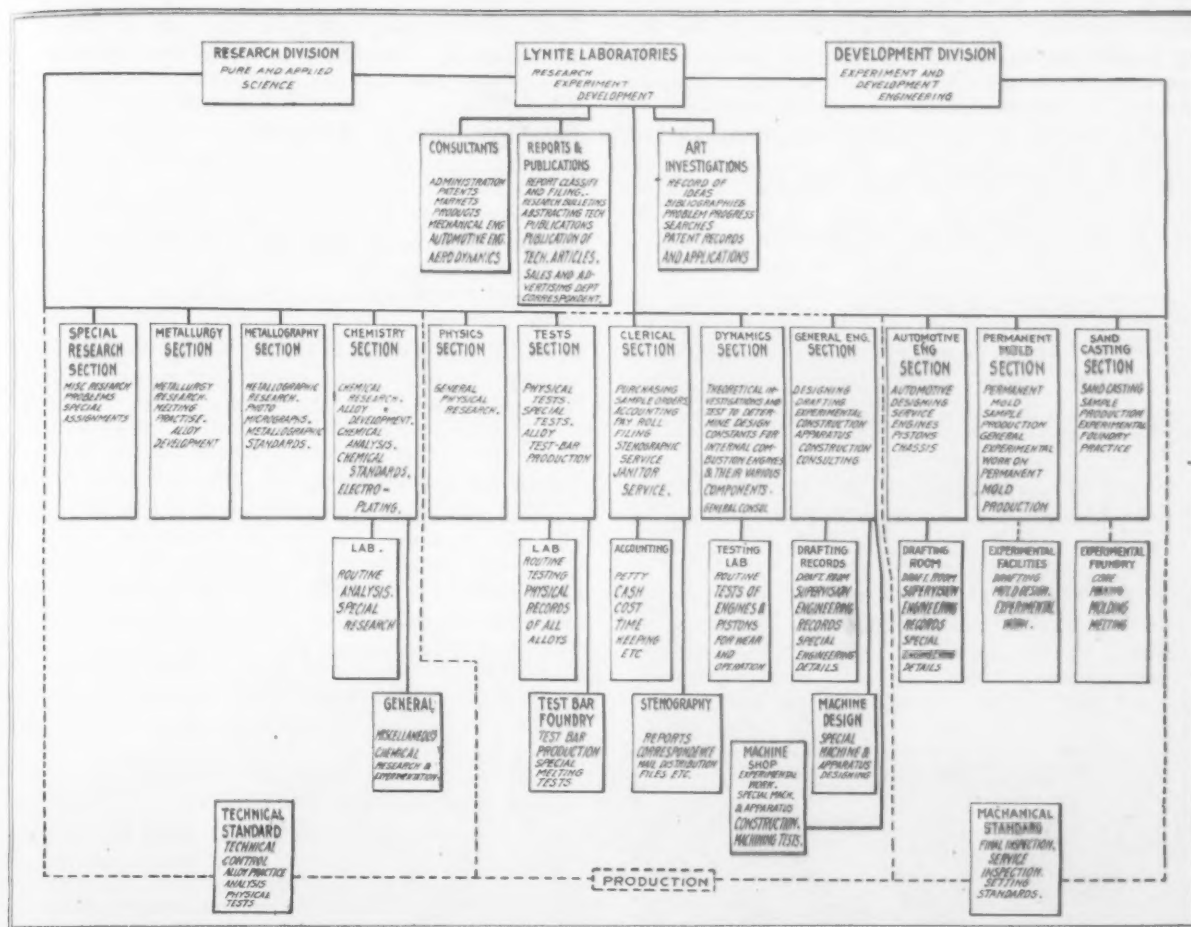
height to which the pendulum rises. It delivers a blow of 200 ft. lb., or the equivalent of a weight of 40 lb. falling 5 ft.

Tests of fatigue and resisting qualities of metal are taken on a White-Souther alternating stress machine, in which a test bar is rotated at a speed of 1328 r.p.m. A load is applied by means of a spring balance through ball bearings at the end of the test bar, which causes a slight bending. Each time the specimen rotates the stress is reversed. Thus, a particle which was in tension at the top of the specimen after one-half turn reaches the bottom and is put in compression. The load applied is varied from 20 to 50 lb., and the time required to break an aluminum alloy test bar varies from one day to a month or more. Other equipment in the department includes an Erichson sheet metal testing machine for testing the cupping properties of aluminum sheets, and an experimental set of rolls for rolling aluminum sheets.

Test bar samples are kept in steel racks, and

are bolted. This gives the equivalent of a bed plate extending the entire length of the floor and makes it possible to move the dynamometers to different positions or to connect two in tandem so that an engine may be tested, having a power output greatly in excess of the capacity of one dynamometer.

The weighing system of the dynamometers, built especially for these laboratories, embodies a multiplying lever so that the scale reads the lb. torque at a 63-in. arm. This makes hp. calculation easy. In this weighing system most of the knife edges have been dispensed with, self-aligning ball bearings being used in their stead. The whole system is said to be so delicate that if a $\frac{1}{4}$ -lb. weight were placed upon the knife edge on the dynamometer field frame, it will show a deflection on the scale. The revolution counting device consists of two Veeder counters, connected through a gear box to the dynamometer shaft. These counters are provided with a jaw clutch which can be thrown in and

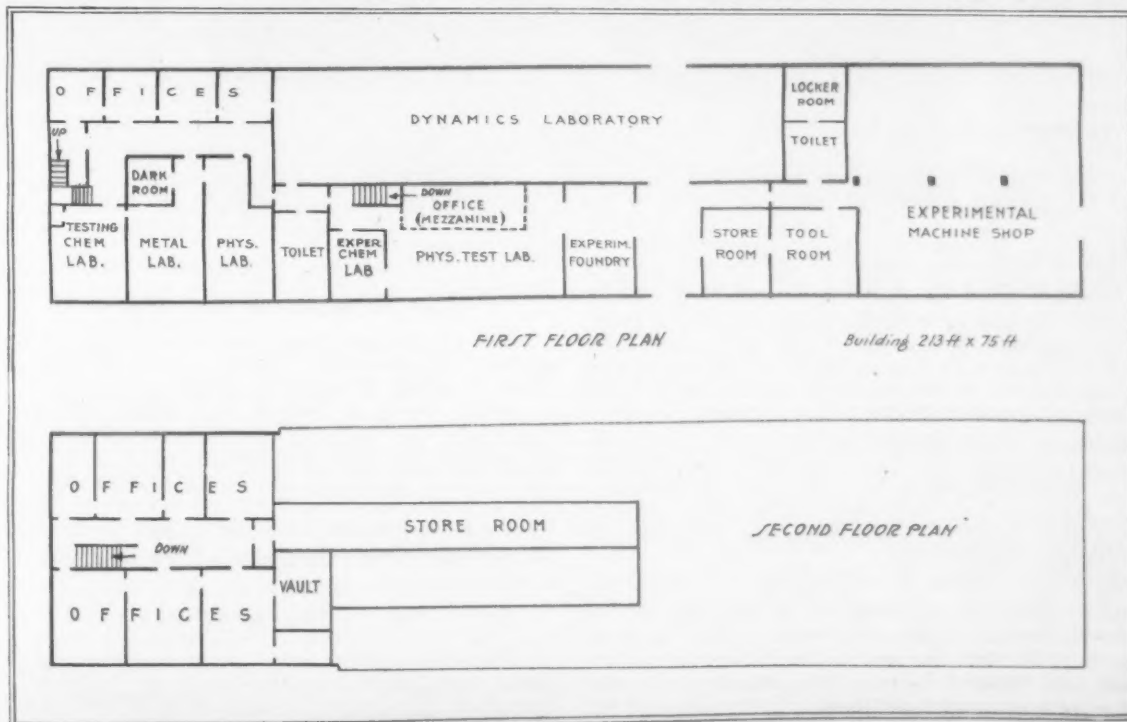


Organization Chart of the Lynite Laboratories of the Aluminum Castings Co., Cleveland, Ohio. The laboratory is devoted to specialized study of aluminum alloys for automotive and airplane purposes

out electrically. The flexible couplings consist of two flanges, one connected to the engine, and one to the dynamometer, and an intermediate piece connected through leather disks to each of the other two flanges. In order that the leather may not be called upon to carry the weight of the intermediate piece, this piece is supported on spherical protections centered in the disks connected to the engine

and dynamometer. The leather, therefore, transmits only the torque. In connection with the 400 hp. dynamometer there is installed a wind tunnel, so that the engine under test may be placed in a breeze varying from 35 to 40 miles an hour.

The fuel is contained in a tank mounted on a delicate scale and fed to the engine by gravity. The air consumption of the engine is measured by



Plans of the Lynite Laboratories. The layout of the building, which is 213 ft x 75 ft, is shown. The building is 2,000 sq. ft. are occupied, accommodating 100 experts

Venturi meters. On its way to the engine the cooling water passes through a Venturi meter, which measures the rate in lb. per minute. The temperature of the ingoing water is kept constant by the use of a thermostat. The heat loss in exhausts is measured in a calorimeter. The work of the dynamics laboratory includes tests of gears, rear axles, etc., and the equipment includes an Alden absorption dynamometer for use in absorbing power at



A 6-Cylinder All-Aluminum Engine on a Test Box Adjoining the Wind Tunnel, and Connected to the 400-Hp. Dynamometer. A breeze of 40 miles an hour can be blown past the engine

the extremely low speeds, such as is necessary for making tests of rear axles.

Two motor generator sets are provided for making direct current. One, a 10-kw., 120-volt, direct-current set, is used for exciting the dynamo-

meter fields and supplying current to the other laboratories. The other is a 150-kw. set and converts 440 volts, 3-phase alternating current, to 250 volts direct current for running the dynamometers. The direct current is distributed through the laboratories from a panel placed between the control panels for two of the dynamometers. Alternating and direct current are located around the walls of the laboratory, and high and low pressure air outlets and gas outlets are conveniently placed. The laboratory is equipped with apparatus for standardizing thermometers and gauges. Four sheets are used for recording observed data, one being for records of power measurements of engines, another for fuel consumption, cooling water and lubrication, a third for recording information relative to air consumption and exhaust measurement, and the fourth for special tests.

The general engineering and automotive engineering workers are closely correlated, but come under two sections. The general engineering section contains a machine shop and tool room equipment for experimental and development work. In this shop special apparatus and machinery is built, test bars are machined, and laboratory apparatus is repaired. The automotive engineering section devotes its attention to theoretical principles of design involved in the evolution of the automobile and to the special branches of automotive design, such as engines and engine parts.

In the permanent mold and sand casting sections the formal problems, after study and tests in the other sections, are actually put into tangible form, and from these sections the new processes and products go into production. These sections exist as complete departments, with their own foundry equipment and machinery. As in every other section of the laboratories, each section is directed by one man and has its own special organization, all supervised by a director of development corresponding to the director of research, both of whom are responsible to the manager.

The third large division into which the research organization of the laboratories is divided is the technical standards division. Its work is to regulate and improve foundry practice in all the company's plants.

Increased Furnace and Mill Operation

Youngstown, Ohio, July 15.—With resumption, July 12, of No. 3 blast furnace at the Ohio works of the Carnegie Steel Co., only five stacks of 25 in the Mahoning Valley remain idle. At least two of these are expected to be pouring metal before the end of July. The Carnegie Steel Co. now has all six stacks at the Ohio works operating, with the furnace at Niles, Trumbull County, still idle. No. 3 was thoroughly overhauled and repaired. The stack of the Struthers Furnace Co. is now in the hands of reliners and is not expected to resume until Sept. 1. Hannah furnace at the Mahoning Valley works and one stack in the Haselton battery remain idle among Republic Iron & Steel stacks. With the settlement of labor trouble at Girard, the A. M. Beyers Co. will shortly blow in its furnace there. The Republic company is also preparing to start its idle Haselton stack.

Valley mill schedules continue to improve. The Republic company is operating all its finishing mills at the Brown-Bonnell works this week except the 20-in. bar mill. The sheet bar mill of the Youngstown Sheet & Tube Co., suspended June 29 for repairs and installation of new equipment, resumed July 10. The mill had been in operation for nearly 10 years. The Sharon Steel Hoop Co. started its plate mill at the Mahoning

Valley works on double turn July 14 and is operating at 100 per cent capacity at its Haselton works.

Heavy shipments are being made from the 84-in. and 132-in. plate mills of the Brier Hill Steel Co. The Trumbull Steel Co. is operating at capacity, including two jobbing mills.

Reorganization of Ford Motor Co.

Through the acquisition of the minority of the stock of the Ford Motor Co., Henry Ford and his son, Edsel Ford, will hold 98 per cent of the stock, while James Couzens, Mayor of Detroit, will retain his interests, amounting to 2 per cent. It is estimated that between \$75,000,000 and \$100,000,000 will be used to take up the minority holdings. Up to the present Henry Ford has held 58½ per cent of the stock of the company. The minority interests bought include stock owned by John F. and Horace E. Dodge, of the Dodge Motor Co.

More Pipe Mills Planned

The Steel & Tube Co. of America, recently reorganized, plans extensive improvements at its Indiana Harbor plant, including the erection of additional pipe mills. The construction of a new lap-weld pipe mill has already been started.

Rolling Equipment of the Inland Steel Co.

Flexible Arrangement of Mills and Accessory Apparatus—An Admirable Motor Room and Turbine Station—How the Plant Was Placed in Operation

IN THE IRON AGE of last week appeared the first installment of this outline of what the Inland Steel Co. achieved in the construction of a new plant, designated Plant No. 2, at Indiana Harbor, to enable the company better to serve the demand for steel which the war created. In the part of the description which has appeared attention was given to an outline of the Inland's equipment in 1915, and to the building of what constitutes an individual steel plant containing 10 open-hearth furnaces, 600-ton mixer, 20 soaking pits, gas producers, coal and ash handling equipment, pumping station, and much else that enters a modern mill.

Herein are given some details of the 28, 32 and 40-in. rolling mills, the motor room and turbine station, miscellaneous construction, and the dates on which some of the main units were first put in operation.

Features of 40-in. Blooming Mill

The 40-in. blooming mill and all accessory equipment, except the drives and billet and crop conveyors, were furnished by the Mackintosh-Hemphill Co. The crop conveyor and outgoing billet conveyor were furnished by the M. H. Treadwell Co.; the incoming billet conveyor by the Mesta Machine Co., Pittsburgh, and the electrical equipment was furnished by the Westinghouse Electric & Mfg. Co. of East Pittsburgh.

A feature of the shear, which has a capacity of 8 x 36-in. slab of hot, soft, open-hearth, basic steel, is that the first three rollers on the shear runout table lift up when the first cut is taken on the bloom and allow the crop end to drop into a hopper underneath the shear, from where it is carried away by the crop conveyor and deposited in cars in the billet dock. In connection with the outgoing billet conveyor is a disappearing, grasshopper type of pusher, which pushes the steel from the table onto the conveyor. It is electrically operated. Beyond the pusher and billet conveyor is an electrically operated billet scale for weighing certain billets in each heat. This is a time-saver, as otherwise a delay would be occasioned while the billet

was being removed from the table and taken to some other point to be weighed. The scale spans the table and the billet is run out on the table under the scale and is picked up and weighed and then dropped back on the table rollers and sent on its way.

The building housing this mill and equipment is 60 x 920 ft., and is served by 15- and 50-ton cranes.

The billet dock, which adjoins the 40-in. mill, is the same length and has the same crane runway span. It is served by two 20-ton and one 15-ton cranes.

Between the 40-in., 32-in. and the 28-in. mills, is

a billet transfer 120 ft. in length and 28 ft. wide, of the rope and dog type. It connects the shear runout table of the 40-in. mill with the mill approach tables for both the 32-in. and 28-in. mills, and passes, in a tunnellike enclosure, directly through the motor room building, practically dividing the latter into two sections.

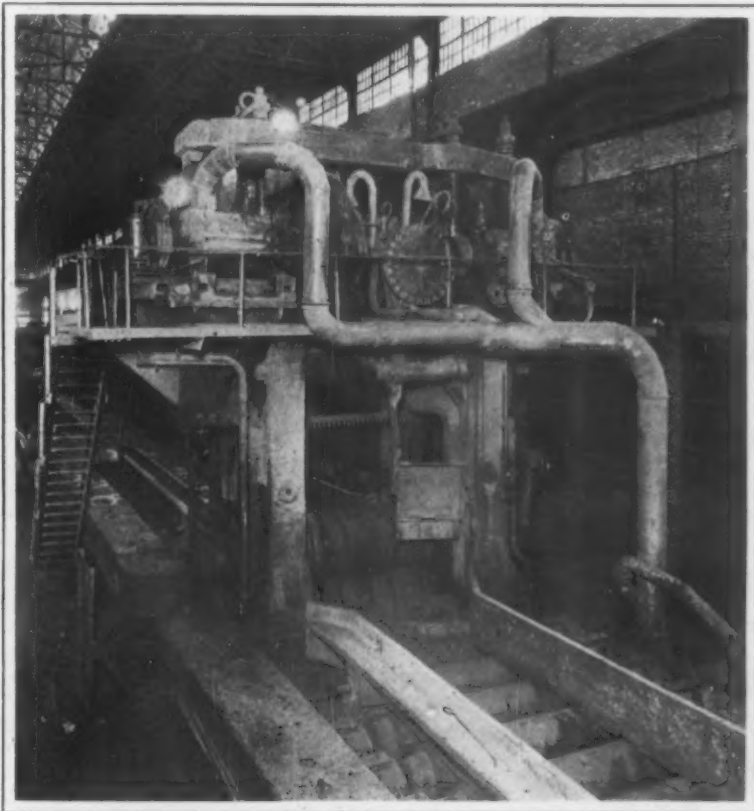
Billets to be reheated before being rolled into the finished product are passed through two continuous reheating furnaces, 19 x 55 ft. This transfer takes place over a furnace transfer and pusher connecting the incoming furnace table of the 40-in.

mill with these furnaces. The incoming billet conveyor, mentioned heretofore, is used in connection with these furnaces when it is desired to reheat and roll into finished product cold billets that have been stored in the billet dock.

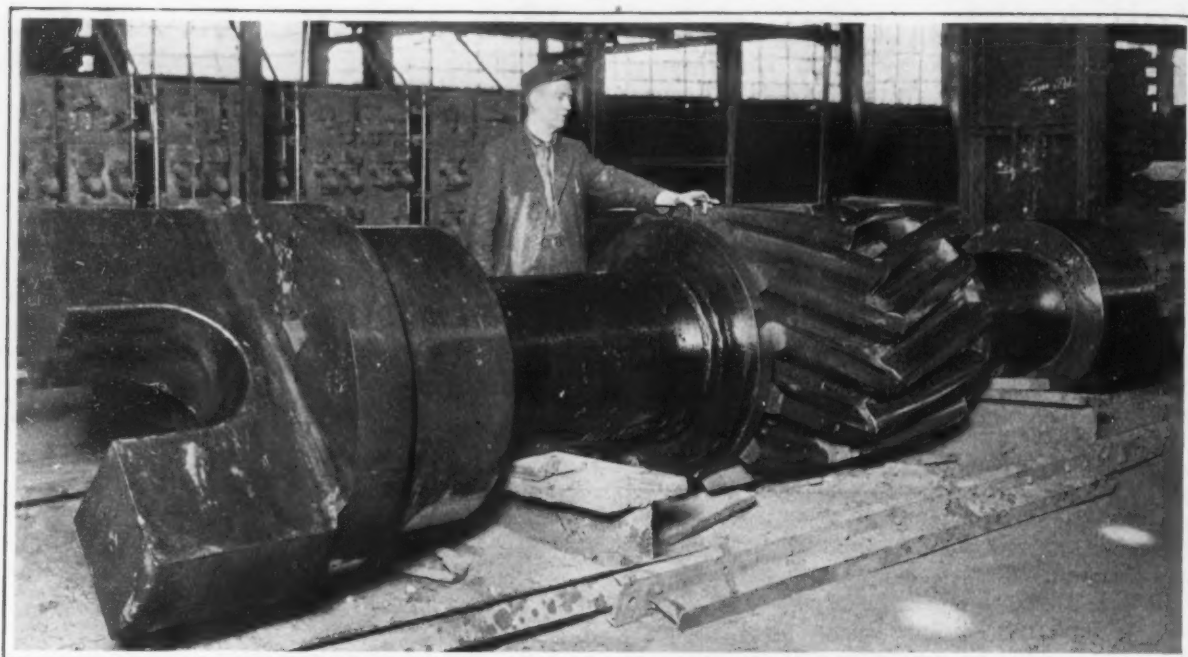
The 32 and 28-in. Mills

The billets are pushed through the furnaces from the 40-in. mill, or ingoing side, and are then dropped by gravity to the furnace table on the outgoing, or 32-in. mill side, involving a drop of approximately 5 ft. 6 in. From this point the billet is carried to the 32-in. mill, broken down to the proper size, and then delivered by means of tables to the 28-in. mill for finishing.

The 32-in. mill is a typical blooming mill, and



The 40-In. Blooming Mill. It is driven by a motor rated at 15,000 hp., but which has attained 18,000 hp. on a peak load. From a speed of 40 r.p.m. in one direction the motor will reverse to the same speed in $1\frac{1}{2}$ sec.



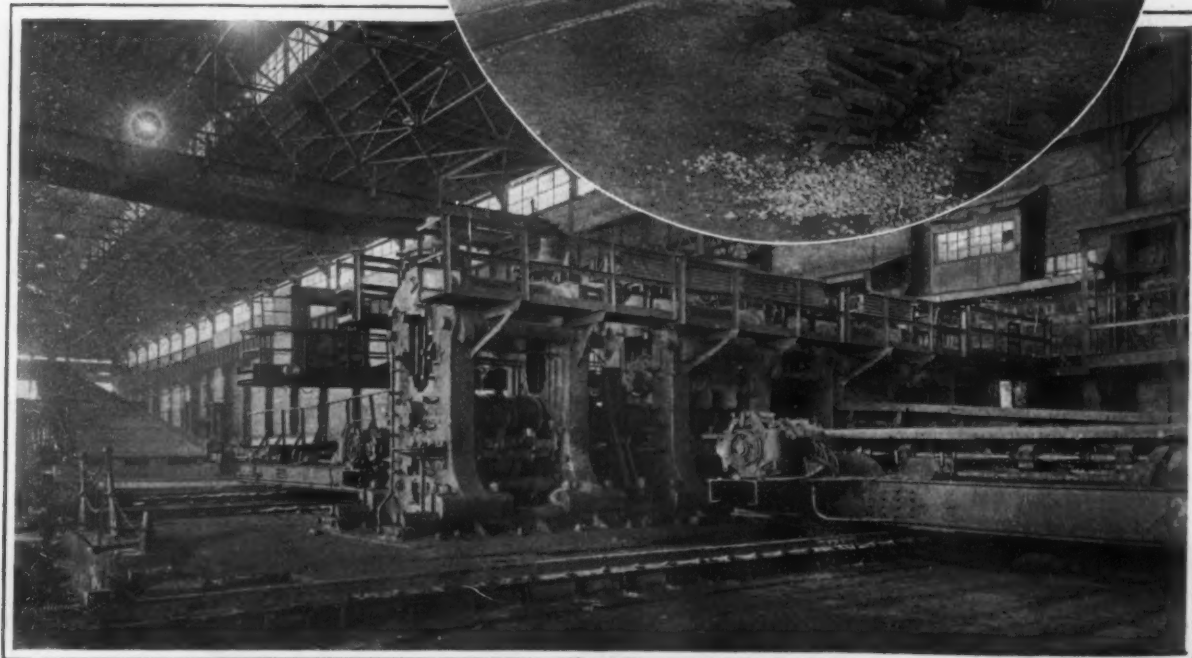
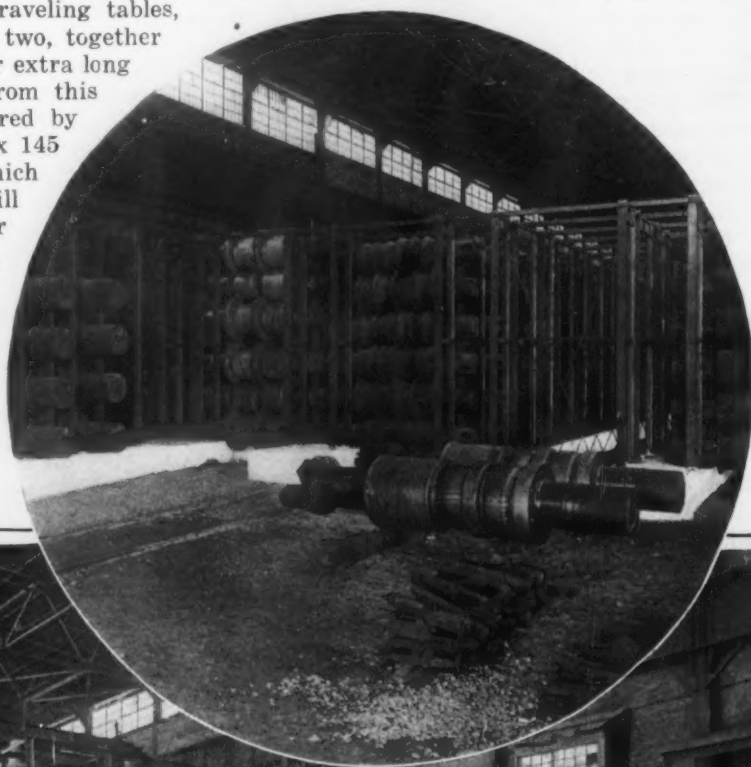
Spare Pinion Such as Drives the 40-In. Blooming Mill

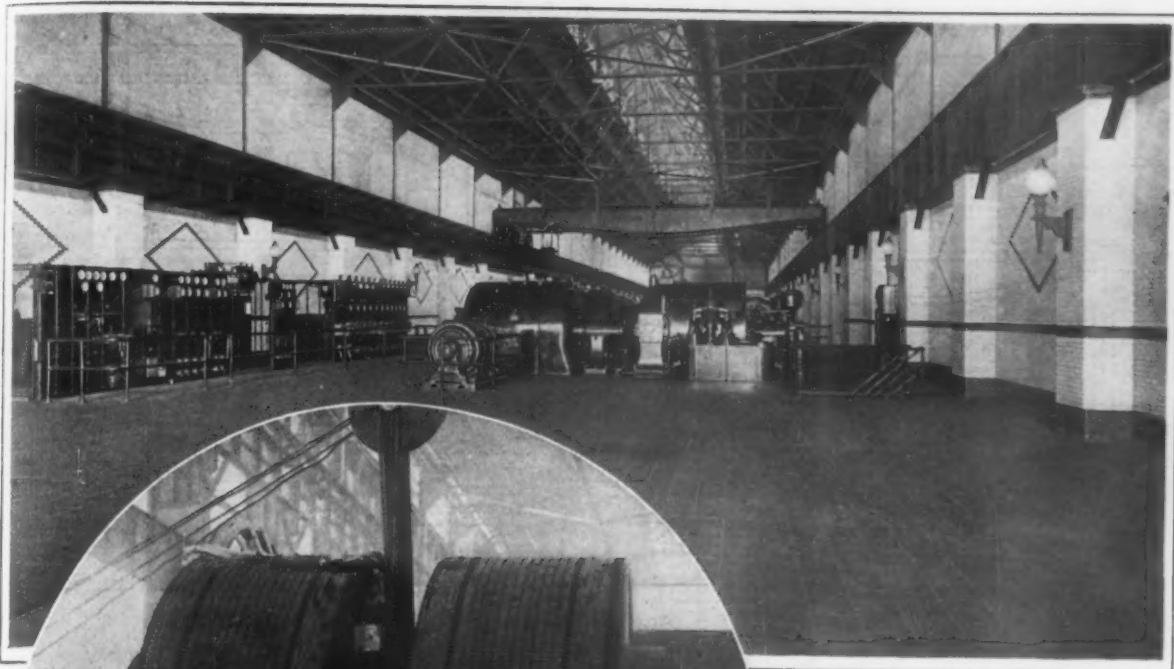
is also served by a shear. The mill, tables and shear are all motor-driven. They were furnished by the Mesta Machine Co.

The 28-in. mill is a three-high, three-stand mill, the passes being served by two traveling tables, which tilt on the ingoing side and two, together with one non-tilting trailer table for extra long sections, at the outgoing side. From this mill the finished product is delivered by means of tables to a hot bed, 115 x 145 ft., of the rope and dog type, which extends from the 28-in. and 32-in. mill building into the warehouse. After cooling, the steel is passed through straighteners. The shears used with this mill are offset from

the table in which the straighteners are set, so that if sections do not have to be passed through the shears, they can go direct to the bulldozers. Sections that have to pass through the

The 28-In. Three-High, Three-Stand Mill, the Passes of Which are Served by Traveling and Tilting Tables. On the outgoing side is an auxiliary trailer table, and an incline for extra long sections. In circle, roll storage accommodating about 600 rolls. It will be enlarged to care for about twice that number





A Motor Room and Turbine Station Which Commands Admiration. The building is 520 ft. in length. In circle is a unique comparison of the largest and smallest armatures used in the plant

house; one opposite the table coming direct from the hot bed and the other opposite the shear runout table. There is also an intermediate table lying between these two tables for emergency purposes.

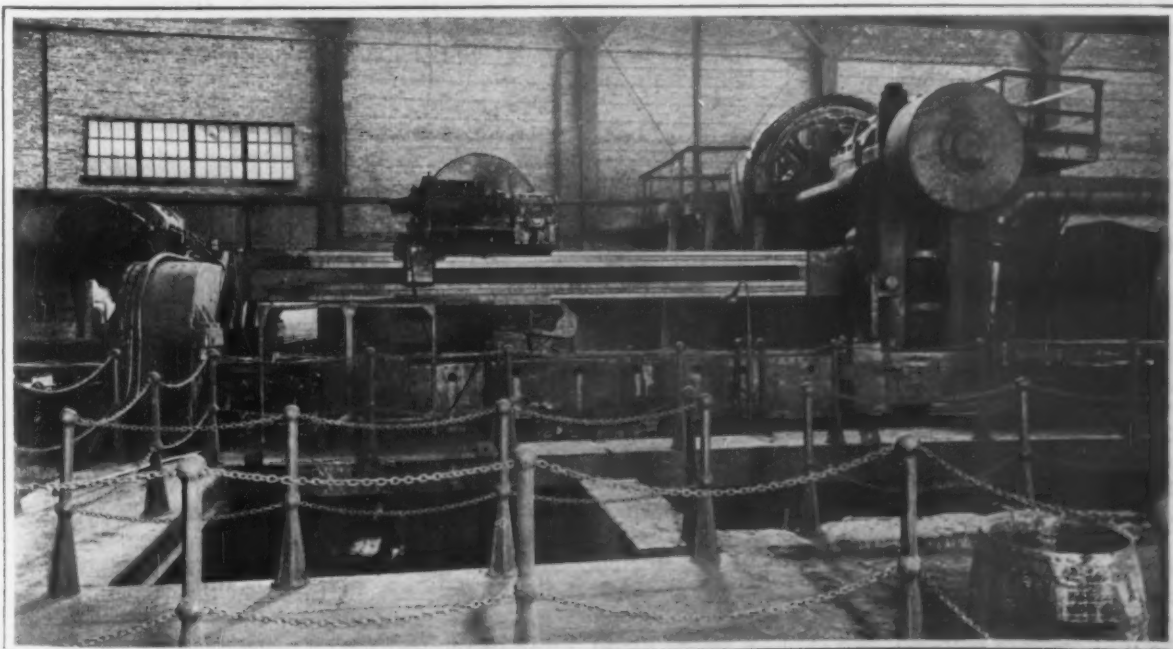
Beyond the saws are the bulldozers, or gag straighteners, connecting with the saws by means of roller tables. The straighteners perform the last operation in manufacturing.

The mill, tables, hot bed, shears, saws and straighteners, etc., were furnished by the Morgan Engineering Co.

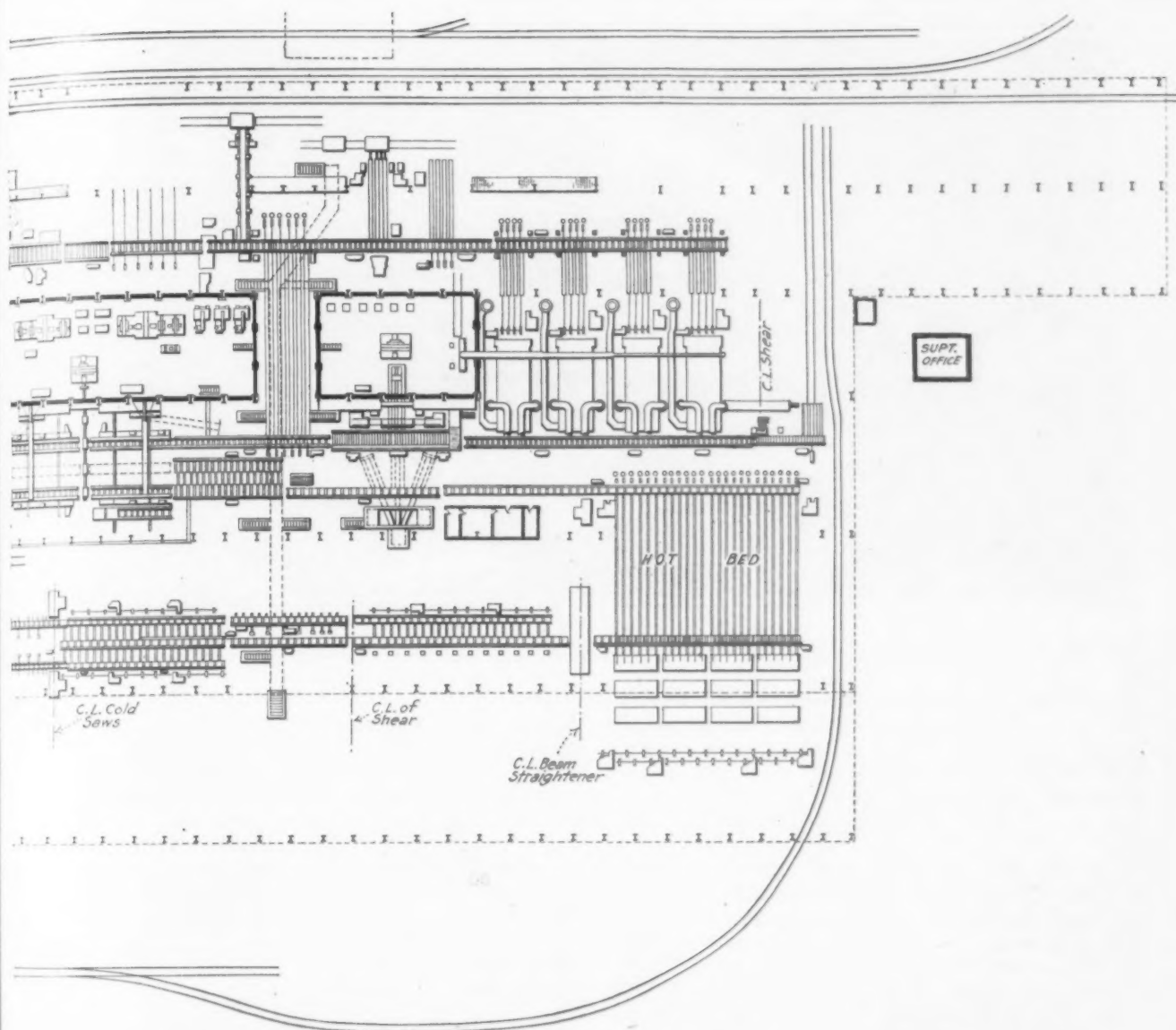
Swinging Pulpit Over Tilting Tables

A feature of the 28-in. mill is the operating pul-

shear are transferred from the straightener table to the shear ingoing table by means of a rope and dog transfer. There are two saws in the ware-



Shear Which Is an Accessory to the 40-In. Blooming Mill. It has a capacity of 8 x 36-in. hot slabs. Three of the rollers in the runout table lift permitting the croppings to drop to a hopper from where it is carried by a conveyor



kw. The set is 47 ft. in length overall, and operates at a synchronous speed of 375 r.p.m. The generators each produce 600 volts and are connected in series, making 1200 volts total. The outfit is also served by an exciter set comprising an induction motor, a constant potential generator and a variable potential generator.

Notable Reversing Performance

The 40-in. mill motor is one of the largest in the world. It has two separate and complete sets of windings, and is, in fact, two motors on the same shaft operated as one. The voltage across each is 600 volts and the two in series 1200 volts. Operated as a unit, it is rated at 15,000 h.p., and will reverse from a speed of 40 r.p.m. in one direction to a same speed in the opposite direction in $1\frac{1}{2}$ sec. Its total weight complete is 268 tons and, when knocked down prepared for shipping, requires 10 cars to move it. The armature alone weighs 90 tons, the shafts being 28 in. in diameter. The connection between the motor and mill pinions is a universal joint, the connection between these pinions and mill also being made by a similar joint. These tend to eliminate backlash. The reversal of the mill motor is controlled by means of a drum type controller located in the pulpit of the mill.

The 28-in. mill is driven by a motor which is operated in only one direction, although it can be reversed. It is rated at 7500 hp., operating on 700 volts.

The 32-in. mill is operated by a reversing motor

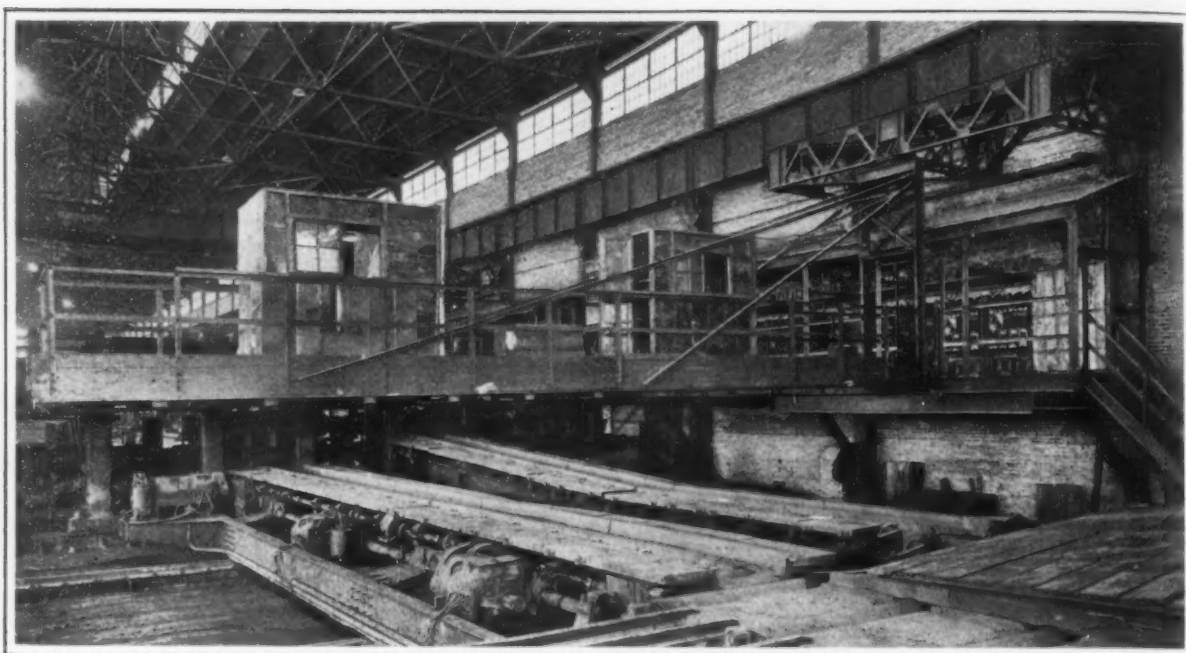
similar in design to that of the 40-in. mill, except that it is smaller, the capacity being the same as that of the 28-in. mill motor. These two motors are served by a separate flywheel motor-generator set, 48 ft. in length, equipped with a 5000 hp. induction motor, 45-ton flywheel, two 1950 kw. 700-volt generators, one for each mill. This also is served by an exciter set consisting of one induction motor, one constant potential exciter and one variable potential exciter for each of the two mill motors. All of this equipment was furnished by the Westinghouse Electric & Mfg. Co.

Because of the heat created by the operation of these units, each has an air-cooling system which sends a current of air through the windings at a rate of 45,000 cu. ft. per min. The air is taken from the motor room proper, passes through air washers and dryers, and then through the motor windings and back into the room to be used over again. With this equipment, the air in the motor room is kept, even on the warmest summer day, at a temperature ranging between 70 and 80 deg. Fahr.

Also in this building are four motor-driven air compressors, each with a capacity of 500 ft. per min. These furnish compressed air for different purposes around the mill.

In Operation by Degrees

The new plant was, of course, started up in sections as fast as completed. The first two open-hearth furnaces were started up before any of the mills, No. 13 on July 28, 1916, and No. 14 on Aug.



Operation of the 28-In. Mill Is Managed from the Pulpits on the Arm Extending Over the Ingoing Tables. The arm is constructed to swing close to the wall, thus out of the way when repairs are necessary

1, 1916, the first heat being taken from No. 13 Aug. 22, 1916. This was done to relieve the open-hearth furnaces in Plant No. 1, which were severely pressed for steel required in that plant. Other furnaces were added from time to time as completed, and at the time the 32-in. mill started, Dec. 30, 1916, eight furnaces were operating in Plant No. 2.

At the time the 32-in. mill started, the 40-in. mill was not ready for operation and the 32-in. mill was used temporarily as a blooming mill. This was rather hard on this mill, particularly on the tables, as they were not built to take the heavy ingots which were delivered directly from the soaking pits. The mill, however, stood up very well and a considerable tonnage was thus turned out.

The 40-in. mill started March 24, 1917, at which time the 32-in. mill went down for overhauling. The 28-in. mill started in September, 1917.

The steam plant of the new steel works consists

of three 1076 h.p. water-tube boilers, equipped with superheaters and soot blowers. These are interconnected with the other high pressure steam lines, which makes the steam producing equipment in Plant No. 2 flexible and allows for considerable economy under varying operating conditions. The boilers are housed in a brick and steel building, 45 x 170 ft., with a wood and corrugated roof. It is in line with the gas-producer plant and is served by the same coal and ash handling system.

Other new structures include a roll shop, and a brick and stock shed, 50 x 800 ft., in which are stored refractory materials.

Miscellaneous Additions or New Work

Other operations, arising from the building of the new plant or to provide additional capacity for the old plant, were as follows:

A three-story laboratory, 60 x 125 ft., was



The New Machine Shop and Boiler Shop Building, 86 x 620 Ft., Has Balconies the Full Length of the Machine Shop Section, 420 Ft. One balcony is occupied by light machine tools, and the other gives access to offices and locker and wash rooms

completed in October, 1918. In this building is handled not only the chemical analyses of ore and coal, etc., but all other determinations, physical and otherwise. It is fireproof, and in it are kept all records as to analyses of heats, etc. It is of brick, has reinforced-concrete floors and floor supports, and contains an air washing and cooling system.

An additional blast furnace, with three stoves and all accessories, was built, giving the company three furnaces. An additional pig-casting machine, with a capacity of 2400 pigs per hr., also was installed, likewise a skulling and ladle repair building, 83 x 120 ft., containing a 40-ton crane.

The ore unloading equipment was increased by two Hoover & Mason 7½-ton ore unloaders.

Because of the additional air capacity required when the third blast furnace was built, it was necessary to install an additional battery of blowing en-



Storage Building of Fireproof Construction. It is built without windows and has a skylight 70 x 100 ft. The 5-ton crane is hand operated from the floor.

gines. These in turn created a need of additional steam capacity and, not then caring to add additional units, superheaters were installed in the blast furnace boilers, similar to those used in connection with the open-hearth waste heat boilers.

The coal storage, in connection with the coke plant, was increased by a series of coal bins with a total capacity of 4000 tons of coal. The bins were connected by conveyor with the original receiving hopper, an arrangement which cut down the unloading time of a coal boat by approximately one-half.

In the coke plant were built 44 additional coke ovens, these necessitating additions to the benzol and by-products plants in like proportion. Also added was a pushing machine and an additional quenching station.

A noteworthy feature of the coke plant is a ram changing station for the pushers, which simplifies the changing of levelers and rams on the pushers and saves time.

A coal-thawing station to thaw frozen coal was erected. It is a brick building equipped with an indirect heating system, has two tracks, and accommodates 12 cars. The time required to thaw

sufficiently for unloading is from 10 hr. to 12 hr. Improvements in Plant No. 1 consisted of the following:

A 13-stall roundhouse, of brick and steel, one section of which is used as a machine shop.

Machine Shop and Storage Building

A machine and boiler shop, 86 x 620 ft., served by 10-ton and 40-ton traveling cranes, a building of brick and steel, covered with wood and asbestos tile, was erected. It has balconies the full length of the machine shop section, which is 420 ft. long. On the balcony of one side are located the light machine tools, and on the other side the offices of the general master mechanic, steam engineer, machine shop foreman and boiler shop foreman, as well as locker, wash rooms and toilets for the men in the building. It is an up-to-date shop in every particular, and allows plenty of room on the main floor for big work. The building has an indirect heating system and a wood block floor.

The company also built a new storeroom, because of an old one having been destroyed by fire. It is of steel and brick, with a wood and asbestos tile roof, in which is a skylight 70 x 100 ft. The building is 67 x 100 ft., and has two balconies. It is served by a 5-ton hand-operated crane. The structure is as nearly fireproof as could be made, the floors and supports being of reinforced concrete.

Contracts to Be Made for Floating Dry Docks

Contracts for eight 10,000-ton floating dry docks to be built by the Emergency Fleet Corporation and sold to private companies are now in the hands of the legal department of the United States Shipping Board, Washington, and probably will be formally approved and signed within a few days. The docks are to be constructed of wood. They will be sold to four companies, which will operate them in conjunction with complete ship repair plants. These companies are the Norfolk & Hampton Roads Ship Repair & Dry Dock Corporation, Norfolk, Va.; Fraser, Brace & Co., 1328 Broadway, New York; the Ramberg Iron Works, Inc., Brooklyn, and the Perth Amboy Dry Dock Co., Perth Amboy, N. J. Each company will receive two of the drydocks. The docks will cost \$800,000 each and will be built in shipyards of the following companies: Narragansett Shipbuilding Co., Tiverton, R. I.; Kingston Shipbuilding Co., Kingston, N. Y.; Atlantic Gulf & Pacific Co., 13 Park Row, New York, yard at Mill Basin, Brooklyn, and W. H. Gahagan, Inc., Arverne, Long Island.

James Stewart & Co., 30 Church Street, New York, will build a ship repair plant for the Norfolk & Hampton Roads Ship Repair & Dry Dock Corporation, at Norfolk, Va., that will be one of the largest of its kind in the country. Fraser, Brace & Co., New York, also have plans about completed for a large ship repair plant, but details are withheld until certain preliminary negotiations are concluded. The Ramberg Iron Works, Brooklyn, already has a ship repair plant and announces that it is not ready at this time to state whether extensions will be made. The Perth Amboy Dry Dock Co. also operates a ship repair plant now. Considerable machinery and other equipment will be required eventually by these companies for the repair plants.

Construction of the dry docks will be financed by the United States Shipping Board and they will be sold to the companies which will operate them. One of the problems of the Shipping Board for some time has been to provide adequate repairing facilities for America's growing merchant marine. The program as originally outlined called for the construction of about twenty dry docks at different points along the Atlantic coast, but this plan has since been considerably modified and probably not over ten will be built. Those mentioned above are all that have been arranged for thus far.

CONTRACTS FOR PLATES

Canadian Government Will Take Large Tonnage from Dominion Steel Corporation

According to an announcement made by C. C. Ballantyne, Minister of Marine, a new contract had been entered into between the Dominion Government and the Dominion Steel Corporation for the delivery within a five year period of 250,000 tons of ship plates at the price of \$3.65 per 100 lb., as compared with the contract made in 1918 at a price of \$4.15 per 100 lb. Following this report Mark Workman, president of the Dominion Steel Corporation, stated that work would be resumed immediately on the plate mill at Sydney, N. S.

"Pending the outcome of the recent negotiations," said Mr. Workman, "the Government requested us last spring to discontinue building operations, which was instantly done. Now that the matter is settled definitely, we will rush the plate mill to completion, and I expect that we shall be rolling by the first of January next. The price of \$3.65 per 100 lb. agreed upon between the Government and the Corporation is quite satisfactory to us, and I believe it is to the Government."

To the observation that a reduction of 50c. per 100 lb. seemed a substantial one, Mr. Workman stated: "That is quite true, but we are facing changed conditions, to those existing when the original contract was drawn up last year. In addition to this we desire to extend every assistance in our power to the successful and highly necessary carrying out of the shipbuilding policy of the Government." Other directors of the company expressed themselves as well satisfied with the outcome of the negotiations, which had been, as Mr. Ballantyne stated, carried out in the most amicable way.

At the new price of \$3.65, the contract involves an outlay on the part of the Government of over \$20,000,000 or some \$4,000,000 annually, and represents a saving to the National Treasury of approximately \$2,800,000. The plate mill which is nearing completion will be a large modern one costing upward of \$5,000,000 and will employ a large number of men. It is the first mill of its kind to be erected in the Dominion. Mr. Ballantyne pointed out that in addition to the demand for plates for shipbuilding purposes, a large quantity of plate is used in Canada and is now imported from the United States for the manufacture of steam boilers, passenger and freight cars, and for bridge building. Obviously the Dominion Steel Corporation will be in a position to meet the demands of the home market in the future. Official confirmation of the agreement was received by the president of the Dominion Steel Corporation from the Canadian Government July 11.

The United States and French Trade

In an address before the Chicago Association of Commerce on July 9, Dr. Marcel Knecht, director of the Bureau of French Information and director of the Franco-American Board of Trade, emphasized the necessity of the adoption of new methods by American industries seeking French trade. He said in part:

"The way to succeed in France, in South America, in Italy, in the whole world, is to be first equipped with American ways, to have the vision which you have, to have quick decision which you have, which nobody in the world equals. But, you must go there, too, with the knowledge of the peoples to whom you are going to sell something. You have to take the French way of doing business if you want to succeed there. You have to adapt yourselves. . . . If the Germans succeeded so well, it was because they knew four or five languages; it was because they sought not to impose a product on a population which did not care for it, but they gave to that population the product which they liked. . . . Business in France is extremely complicated. To do business in France you have to know the family, the people, the city, the state, the prejudices of the state or the qualities of the state with which you are doing business, and even when you know that, and when you come to present your goods, sometimes

you are refused if the goods don't please, but never think that a business man in France does business in the quick way you do it."

Dr. Knecht stated that American universities, business schools and colleges are not prepared for foreign trade, and recommended that Frenchmen be employed as representatives of American firms in France. A distinct advantage of this plan, he pointed out, would be the protection American business would derive if a subsequent wave of nationalism would prejudice France against the encroachments of foreign business.

The recently organized Franco-American Board of Trade, including in its membership J. P. Morgan, Brown Brothers and other American bankers, as well as important French interests, was pointed to by Dr. Knecht as an instrument of great potentialities in developing trade between France and the United States. He frankly admitted that French buyers will require long credits for a few years, but predicts that France will recover economically much sooner than many Americans expect.

French Surtaxes on Imports

WASHINGTON, July 15.—Complete details regarding the schedule of ad valorem surtaxes on import duties as provided in the French law of June 14, have been received by the Department of Commerce. These surtaxes are additional to the regular import duties and are imposed in order to restore in part the same relative weight between values of the goods and duties payable which existed at the time the present tariff was adopted. A further object is to protect domestic industries during the period of readjustment by restricting imports, the prohibitions on importations having been raised for the most part.

The surtaxes apply to the goods specified in 411 tariff items, including practically all manufactured goods. Most unmanufactured mineral substances and metals are exempt.

The maximum rates of 40 per cent and ad valorem under the general tariff, and of 20 per cent under the minimum tariff apply to comparatively few goods, but in the list are agricultural tractors, axles for railway cars, shafting, manufactures of tempered cast iron, stoves, and ranges and structural ironwork. A larger number of articles are subject to a surtax of 30 per cent under the general tariff, and 15 per cent under the minimum. The majority of articles are subject to rates of 20 per cent to 10 per cent under the general tariff; and of 10 per cent or 5 per cent under the minimum.

Automobiles weighing less than 2500 kilos (5509 lb.) continue to be dutiable at 70 per cent ad valorem without surtax, but for those of greater weight, there is now a surtax of 10 per cent ad valorem under the minimum tariff, which in this case applies to imports from the United States. Agricultural tractors from the United States are now subject to the minimum surtax of 20 per cent ad valorem, while for other kinds of tractors the rate is 10 per cent.

American machine tools under the minimum tariff will be subject to tax of 10 per cent, while for other machines the rates range from 5 per cent to 30 per cent.

The new surtaxes are based upon the value of the goods at the time of importation in the custom-house of entry but not including the import duties. They do not apply to goods shipped directly for France prior to June 18, nor to those in transit at that date directly to Europe with France as the destination.

Poland's Needs

WASHINGTON, July 15.—A list of articles desired at once in Poland as compiled by committees representing industries of that country, includes the following: steam motors (18,600 horsepower), 240; electric dynamos and transformers (76,000 kilowatts), 3000; sundry machinery utensils, 4400; apparatus parts, 11,000 tons; metals exclusive of iron and steel, 2700 tons; steel for utensils, 1700 tons; beet-sugar knife blades, 15,000; oil cans, refractory crucibles, 15,000.

The estimated annual requirements of Poland in iron and steel include 600,000 tons iron and manganese, 400,000 tons cast iron and 300,000 tons of rolled iron.

Improved Case-Hardening Process

Slow Cooling of Nickel Steel Gears for Automobile and Airplane Engines Prevents Flaking and Chipping—Practical Results

CERTAIN modifications in case-hardening processes were described by D. Hanson and J. E. Hurst before the May meeting of the Iron and Steel Institute in London. These new departures from regular practice came about as a result of an investigation into the prevention of the flaking and chipping of certain case-hardened articles such as nickel steel gear wheels used in motor car and airplane engines and straight carbon steel camshafts. Over half of the paper is taken up with a discussion of the theory of case-hardening. An abstract of the experimental and practical portion of the paper follows:

Among the articles in which cracks had developed during grinding were a variety of forms of gear wheel, made from a nickel steel of approximately the following composition:

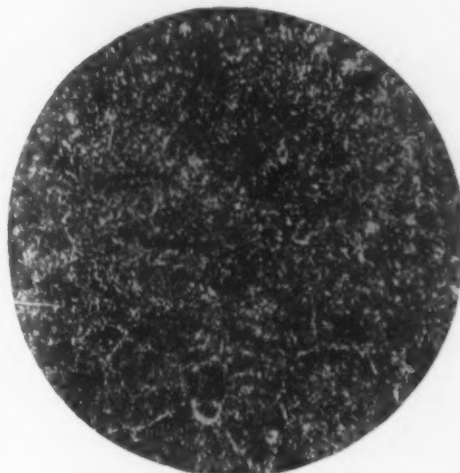
	Per Cent.		Per Cent.
Carbon	0.12	Manganese	0.59
Silicon	0.17	Nickel	2.30
Sulphur	0.026	Chromium	0.11
Phosphorus	0.006		

These gears had been carburized in a mixture of charred leather with 10 per cent of barium carbonate for a period of 10 hr. at a temperature of 900 deg. C., after which the box was withdrawn and cooled in air. For refining and rehardening a subsequent reheating to 800 deg. C., followed by oil quenching, was adopted, and after this treatment the mechanical properties of the core and the hardness of the case were perfectly satisfactory. The gears were sent to another firm for

actual chemical analysis of the case, but in view of the fact that most of the articles concerned were made of alloy steels, in which the actual composition of the eutectoid is not known, they came to the conclusion that the microscopic method, though it is not strictly quantitative, was to be preferred.

In the first place, they took three bars 6 in. long by $\frac{1}{4}$ in. diameter, of a 2½ per cent nickel steel, which were passed through holes in the side of a carburizing box, and heated in contact with the mixture for 6½ hr. at 900 deg. C. The box was then withdrawn, one bar being quenched in oil, another cooled in air, and the third allowed to cool in the box. The structure of the oil-quenched bar, illustrated in Fig. 2, shows a complete absence of free cementite. The bar, which was cooled in air, was martensite in the case, but a certain amount of carbide had separated, not in network form, but as a series of long thin needles. Air cooling, even on a small bar of this size, is not sufficiently rapid to keep the cementite dissolved. The slowly cooled bar, illustrated in Fig. 3, contained a coarse thick network of free cementite, and the steel of the outer parts of the case was undoubtedly hyper-eutectoid. It seems fairly certain, then, that the conditions under which carburization had been carried out were such as to favor the presence of a coarse network of free cementite.

Some experiments were undertaken to ascertain with what rapidity a carbide concentration greater than that of the eutectoid was attained in the case under the



Figs. 1 and 2—Case in 2 Per Cent Nickel Steel Carburized at 900 Deg. C. Fig. 1 was quenched at 800 deg. C and shows network of free cementite. Fig. 2 was quenched from the box and shows coarse martensite only. Fig. 1 is 100 diameters and Fig. 2 is 1000. Both were etched with 1 per cent nitric acid in alcohol



grinding, and many of them failed during this operation, through the formation of fine cracks running from the surface into the metal. On cutting sections through the teeth of a number of wheels, and examining them carefully under the microscope, in almost all cases a certain amount of free cementite, arranged in cellular form, was detected at the edges of the teeth. It was not invariably found, and in some cases might have been removed during the grinding process, but it could nearly always be observed. Fig. 1 shows an etched cross-section of a hardened tooth which had failed, in which the presence of excessive cementite is unmistakable.

In view of the fact that free cementite could be found in nearly all the wheels, and that it appeared probable that the method of carburizing used would always give a hyper-eutectoid case, the authors conducted some experiments with the object of determining approximately the amount of excess carbide over the eutectoid composition which was formed. In these experiments they have used only the method of microscopic examination. They would have preferred to add to this

normal working conditions. Four small boxes, each containing one bar, 1½ in. diameter, of 3 per cent nickel steel, were inserted in a furnace at 900 deg. C.; these were removed at intervals of one, two, three and four hours respectively, after the furnace temperature had been attained, and allowed to cool in air. Sections were carefully cut and examined. In the bar which had been treated for one hour no excess of carbide was found. In the bar which had been at 900 deg. C. for two hours a carbide network was present in appreciable quantity, and this quantity increased progressively as the length of carburizing became increased. It is evident, then, that a high concentration of carbide in the peripheral layers is reached relatively rapidly—in a time, in fact, which is less than any normal commercial carburizing operation, and while the actual depth of the case is quite small.

Slow Cooling

Experiments were then undertaken on this steel, to determine whether the treatment outlined in the earlier

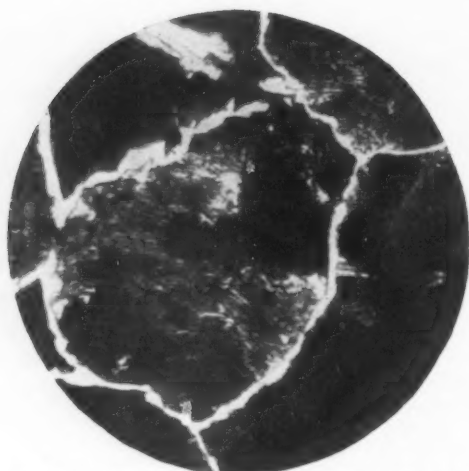


Fig. 3—Case in 2.50 Per Cent Nickel Steel, Carbonized at 900 Deg. C. and Cooled in the Box, Showing Cementite Network. Etching was in 1 per cent nitric acid in alcohol. Magnification, 1000 diameters

part of this paper, of submitting the steel to a slowly falling temperature during the later stages of the carburization, would give a case in which the harmful cementite network was not found.

Pieces of the 2½ per cent nickel steel were heated in contact with the carburizing material for 6½ hr. at a temperature of 900 deg. C., at the end of which time, as has been shown, there is a high concentration of carbide in the outer portions of the case. The temperature was then gradually reduced to 800 deg. C., the refining temperature of the core, which temperature was reached in 4½ hr., and was maintained for a further four hours, the total length of the whole operation being 15 hr. It was found that by this treatment a depth of case was obtained equal to that formerly obtained by 10 hr. heating at 900 deg. C. These times were arrived at after a few preliminary experiments. The specimen was then cooled in the box, which was removed from the furnace.

Microscopic examination showed that this treatment had been very successful. The outer portions of the case contained in no part more than a slight cementite network, as illustrated in Fig. 4. The superiority of this structure is apparent, and on quenching the steel from 800 deg. C. it was found that no cementite was left undissolved, and the structure consisted of a uniformly fine martensite. Fig. 5 illustrates this structure.

In other cases the lowering of the temperature from 900 deg. C. was slower; in many operations on a works scale the whole period of 8½ hr. was taken for this lowering, when the box was withdrawn without further treatment, with results which were quite satisfactory. Annealing for one or two hours at the lower

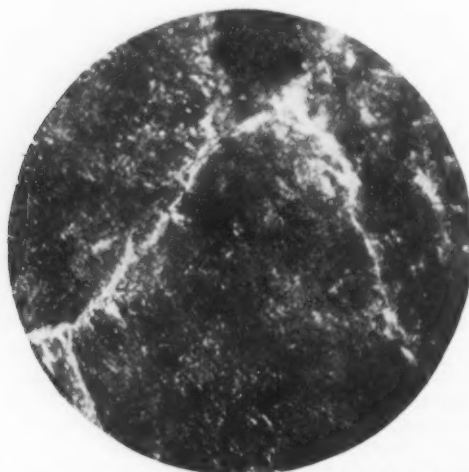


Fig. 4—Case in 2.50 Per Cent Nickel Steel Carbonized by Falling Temperature Method. It was cooled in box showing slight traces only of cementite network. Etching and magnification same as Fig. 3

temperature, however, appears to give a case slightly lower in carbon than a treatment in which the box is removed immediately 800 deg. C. is reached, but in all

the cases examined no free cementite was found after the articles had been hardened.

More recently the authors have carried the reduction of temperature somewhat further. In the above cases the final temperature has been that of the refining operation. In their later experiments, and in routine operations on a large scale, this final temperature has been reduced to a point between the refining temperature of the core and the hardening temperature of the case. In articles made from 3½ per cent nickel steel, the falling temperature treatment has been carried out from 900 deg. C. to 740 deg. C. in the same time of 8½ hr., and the results have been entirely satisfactory. A case in 3½ per cent nickel steel obtained by carburizing at 900 deg. C. for 6½ hr. and from 900 to 740 deg. C. in 8½ hr., followed by cooling in the box contained in the outer layers mere traces of a cementite network, and a layer of steel of practically eutectoid composition extended from the surface for a distance of 0.05 in. into the steel. Further, the transition from case to core was very gradual, and took place over a distance of 0.03 in. There was no sign of "liquation" at any point, and indeed the authors have failed to detect any signs of this phenomenon in any of the steels which they have examined after submitting them to this treatment.

Practical Results

This modification of the case-hardening process has been adopted for some months past in the works of D. Napier & Sons, Ltd., in all operations on straight carbon and nickel steel parts (except 5 per cent nickel steel), and has given highly successful results. Many thousands of articles have been treated, and the amount

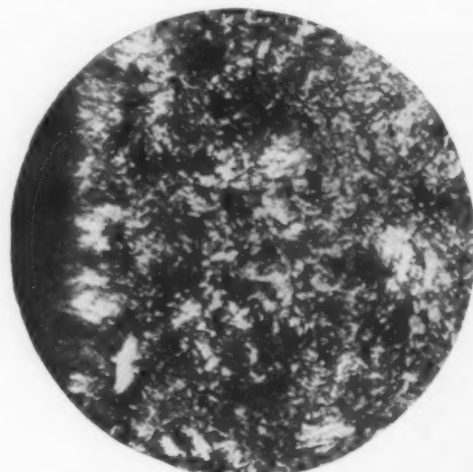


Fig. 5—Case in 2.50 Nickel Steel. Same specimen as Fig. 4 after hardening at 800 deg. C. It shows absence of cementite network. Etched in 1 per cent nitric acid in alcohol. Magnification, 150 diameters

of scrap material has been reduced from at least 25 per cent to practically nothing. For example, by the old methods of carburizing, the scrap in the manufacture of air screw shaft gears from a 2½ per cent nickel steel amounted to 25 per cent. On adopting the 900 to 800 deg. C. falling temperature treatment, this was reduced to 2½ per cent. On changing to the 900 to 740 deg. C. treatment (the steel at the same time being altered to 3½ per cent nickel), up to the time of writing, out of seventy-five completed gears, none has been found defective. Experience with other forms of gears has been equally satisfactory.

In the manufacture of valve end-pieces from 3½ per cent nickel steel, out of the first 500 manufactured (by the old method of carburizing at 900 deg. C.) at least 25 per cent were defective. By adopting the 900 to 740 deg. C. falling temperature treatment, the trouble has disappeared.

With straight carbon steels equally satisfactory results have been obtained. In the manufacture of cam-shafts, for example, the only failures which have been experienced since the modifications were introduced are very small in number, and can, in each case, be traced to excessive non-metallic enclosure in the steel. In every case in which grinding cracks have developed,

a sulphur content of over 0.10 per cent has been found, and microscopic examination has revealed large quantities of sulphide.

It may safely be said that since the introduction of the modifications of the case-hardening process which have been described, troubles from flaking and cracking during and after grinding have become practically unknown, and the very few cases which have occurred can all be connected with material which is otherwise defective.

Carburizing of 5 Per Cent Nickel Steel

In the case of articles made from 5 per cent nickel

steel, trouble from flaking has never been experienced, in spite of the fact that the usual practice has been to carburize at a temperature of 950 deg. C., a temperature considerably higher than that used for any of the other steels mentioned in this paper, and at least 150 deg. C. above its upper critical point. The authors suggest that the explanation is probably to be found in the fact that this steel, when carburized, is air-hardening, and normal slow cooling in the box is sufficient to suppress the carbide separation, or at any rate, to prevent its separation in a harmful form. They have not, however, investigated this steel.

INDUSTRIAL RELATIONS

Status Under Existing Conditions—The Three Important Tendencies

In analyzing the relationship of employer and employee, L. P. Alford in an address before the American Society of Mechanical Engineers at Detroit, June 16, defined "industrial relations" as comprising "that body of principle, practice and law growing out of the interacting human rights, needs and aspirations of all who are engaged in or dependent upon productive industry." This does include not only the interests of employers and employees who are actually engaged in industry, he stated, but likewise of others who are dependent upon productive industry for the satisfaction of their needs, or for the safeguarding of their rights.

The need for proper industrial relations he analyzes as follows:

It is frequently stated that the necessity for establishing industrial relations today is the growth of the factory system wherein all personal contact is lost between owner or manager and the worker. While this is true, it does not sum up the entire loss. In the system of absentee directorate there are other evils as well, and these taken together have set up situations where there have been clashes over the rights, needs and aspirations of those who belong to the class of employers and those who form the great group of employees. These losses in fitness for control may be stated in this wise:

- (a) The loss of personal contact and relationship that formerly existed between the master and his skilled workmen and apprentices.
- (b) The loss due to the lack of personal knowledge of the work being done on the part of present-day directors and managers.
- (c) The loss due to the lack of personal knowledge of the tools and equipment used in production on the part of present-day managers.
- (d) The loss of the direct oversight of saving and conserving materials and human effort on the part of present-day managers.
- (e) The withdrawal from productive work of the families of the directors and managers.
- (f) The loss of equality of living conditions between the families of the directors and managers and the workers.

Examination reveals six major lines of development amid the various methods, plans and systems that have been tried in seeking to work out better industrial relations. These are:

- (1) Profit-sharing plans.
- (2) Methods of wage payment.
- (3) Methods and laws to reduce the hazards in industry and mitigate the effects of injuries and occupational diseases.
- (4) Employment management.
- (5) Declaration and enforcement during the period of war of three rights of workers, namely, collective bargaining, restricted hours of labor and the living wage. Declaration of these same rights and others in the Treaty of Peace.
- (6) Systems for mutual or joint control by employers and employees.

It is more than likely that many of these activities will always find a place in industry, but none of them seem to be a major line of development, and in fact all classify under welfare work or industrial betterment, which have fallen into disrepute because of the

motive of charity or paternalism that has inspired them in many places. The element of failure in all these agencies is the lack of removal of the fear of unemployment. For the fundamental cause of industrial unrest is the dread of losing the opportunity to work and thereby secure the necessities of life, or of being cut off from deserved promotion.

With this development of motive has been a broadening of the recognition of those who are interested in the proper carrying on of industry itself. Three tendencies in this development of industrial relations seem to be new though they are not novel. The first is the acceptance of the motive of service, which on moral grounds declares for recognition of the rights, needs and aspirations of every one engaged in or dependent upon industry. It is the engineering viewpoint rendered unselfish. The second is the willingness to consider workers in groups. By training and experience the engineer has only been willing to look upon workers as individuals. The third tendency is toward mutual or joint control, toward mutuality and the working out of representation. It is an expression of democratic ideals.

Fall Meeting of the American Electrochemical Society

The tentative program for the Chicago meeting of the American Electrochemical Society, Sept. 23 to 25, 1919, has been announced. Several sessions will be held jointly with the American Institute of Mining and Metallurgical Engineers, which meets in Chicago during the week of Sept. 22.

On Tuesday, Sept. 23, the society and institute will go by boat to Gary, Ind., for inspection of the plant of the United States Steel Corporation. A symposium on electric steel will be held on the boat and continued at the Congress Hotel in the evening.

Wednesday morning the society will hold a general session and in the afternoon a joint session with the institute in a symposium on non-ferrous electro-metallurgy. In the evening a special visit will be made to the electric furnace display at the National Exposition of Chemical Industries at the Coliseum.

Thursday will be devoted to a symposium on catalysis, to be followed by a smoker in the evening.

On Friday the institute may hold its symposium on pyrometry, to which members of the society are invited.

Headquarters of both the society and the institute will be at the Congress Hotel, and according to present plans all sessions will be held there.

The American Electrochemical Society's headquarters at the Chemical Exposition will be Booth 229, on the balcony of the Coliseum.

According to a report received by the Department of Commerce from P. L. Bell, trade commissioner at Medellin, Colombia, manufacturers in that country prefer American machinery to European. An objection of the American product, however, is that the packing oftentimes is so carelessly done that damage is caused en route.

A graphic color chart with directions for its use in the treatment of the company's O N brand of high speed steel is being distributed by the Onondaga Steel Co., Inc., Syracuse, N. Y.

GRADED SILICA CORE SAND

Employed with Marked Success in Electric and Semi-Steel Foundries—Use Expanding

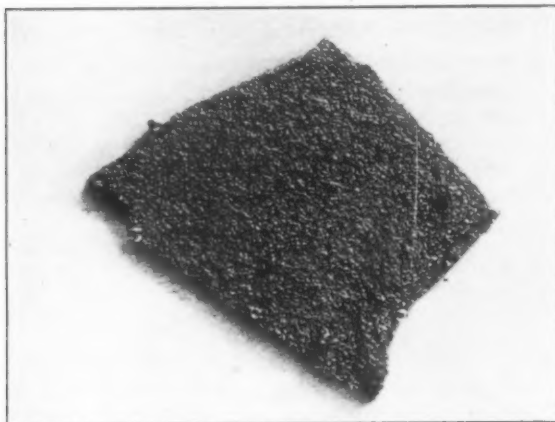
BY G. L. LACHER

One of the principal problems confronting the core maker is to make due allowances for the wide variations in the quality of the sand. If the interstices between the grains are clogged with dust and impurities in any portion of the core, the gas pressure collected there is liable to create blows. On the other hand, if the core is too weak at any point, the casting is likely to swell. In addition, ordinary bank sand generally contains a considerable proportion of natural fluxes—salts of calcium, magnesium and iron, which have low melting points and fuse with the molten metal, thereby causing imperfections in the casting.

Difficulties experienced in electric steel foundries stimulated the consideration of carefully prepared sand for cores, because of the fact that, although quiet metal was obtained from the furnace, imperfections in the castings indicated the formation of gases, as well as the presence of fluxes, in the cores. This theory was borne out by experiment. An analysis of an exceptionally high grade crude sand by Robert W. Hunt & Co. showed the following results:

	Per cent
Silica	98.38
Iron oxide	0.14
Aluminum oxide	1.14
Calcium oxide	Trace
Magnesium oxide	Trace
Sulphuric anhydride	Trace
Loss in ignition	0.30

It is believed the ingredients were probably combined in the following proportions: Silica, 98 per cent; aluminum silicate, 1.06 per cent; iron hydroxide, 0.19



Portion of Casting Showing Clean, Uniform Surface
Produced by a Core Made of Prepared Sand

per cent; aluminum hydroxide, 0.71 per cent. On heating to the temperature of the molten metal, the iron and aluminum hydroxides are reduced, forming, at normal pressure and the temperature of the molten metal, 8.037 cu. ft. of gas from 100 lb. of sand. Much larger proportions of impurities have been found in samples of sand of inferior quality.

Believing that a reduction in imperfect castings could be effected by the use of purified sand, electric steel foundries caused the United States Silica Co., previously engaged exclusively in the production of sand for sand-blasting castings, to supply them with refractory and dustless material, screened to uniform size. Not only was sand required which would not generate gas, but it must also be free from impurities which flux at temperature below that of the molten electric steel, which is very high.

Foundries engaged in the production of semi-steel shells also used prepared sand with success. Considerable quantities of gas form in casting semi-steel, making the use of free venting cores imperative. The pouring temperature in these foundries, as in the electric steel foundries, is high. The latter consideration was of particular importance in casting shells as these re-

quired machining, the cost of which was greatly increased when portions of the core were burnt on to the casting.

The material produced by the United States Silica Co. is obtained from deposits formed through the disintegration of St. Peter's sandstone and is almost chemically pure silica. It is put through an intensive screening process and then graded to size. The requirements of different classes of foundries vary, electric steel foundries, for instance, requiring a coarser sand than gray iron foundries.

Mixtures of oil and prepared sand have been used successfully in ratios of 1 to 150. Experience in the use of prepared material indicates that some changes in usual core room practice bring the best results. The core oil, mixed with dry sand, forms a thin film over the granules, leaving adequate venting spaces between them. After the sand is thoroughly mixed with the oil, water is added, but this addition merely fills the interstices between the granules and does not affect the quantity of oil required, as the oil adheres firmly to the sand through capillary attraction. Following the addition of the water, the sand is again thoroughly mixed. The core is then prepared and baked in a slow oven, the temperature of which is kept below 450 deg. Fahr.

One of the advantages claimed for prepared sand is that it reduces the skill required in core making and makes possible the chemical standardization of mixtures. The United States Silica Co., has found that, in general, heavy cores should contain 150 parts of sand to one of oil, or better, while small intricate cores should be prepared in the ratio of 100 to 1, or better.

It is pointed out that the core sand, being free from natural fluxes, does not burn on to the castings, and that rattling easily removes all traces of the core. As prepared sand melts at approximately 3500 deg. Fahr., less attention need be paid to the pouring temperature, because there is little danger of exceeding the melting point of the core.

Foundries are now using prepared sand for both molding and core work, some using a mixture of two parts prepared sand to six of gangway for molding, thus getting better results than they did with four parts new bank sand and six of gangway. Good results have also been secured by using prepared sand in parts of the mold where a clean casting face is particularly desired.

Receivership of Shipbuilder May Be Averted

A receivership for the Pusey & Jones Co., Philadelphia, a large shipbuilding concern, will probably be averted through the action of the Emergency Fleet Corporation last week in making payment of \$2,500,000 to the company for steel ships contracted for during the war. The petition for a receiver was filed several weeks ago by a number of the smaller creditors. The larger creditors, represented by E. S. Hobbs, counsel for the Iron and Steel Board of Trade, Woolworth Building, New York, opposed the receivership proceedings and endeavored to obtain settlement of all accounts from Christopher Hannevig, head of the company. Mr. Hannevig was in Europe at the time the receivership action was started. It is stated that the financial troubles were due largely to the slowness of the Emergency Fleet Corporation in making payments for ships.

The Pusey & Jones Co. is a consolidation of the Pusey & Jones Shipbuilding Co., Wilmington, Del., the New Jersey Shipbuilding Co. and the Pennsylvania Shipbuilding Co., both at Gloucester, N. J. Interests affiliated with the Duponts are negotiating for the purchase of the Wilmington plant, and this sale will probably be made, according to present information. Mr. Hannevig has announced that the New Jersey and Pennsylvania yards will be operated on a larger scale than before. Plans have been drawn for the construction of three dry docks at the Gloucester yards of the company.

A special type of portable cord for use with portable lamps, tools, etc., has been developed by the Belden Mfg. Co., Twenty-third Street and Western Avenue, Chicago. The conductors have a 1/32 in. wall of 20 per cent rubber and an outside cover of heavy twine.

Relative Size in Heat Treatment

Practical Examples on Various Sizes of Carbon and Alloy Forgings—Results in Hollow Material—Effect on Hardness

BY T. G. STRAUB*

PROBABLY no one branch of the steel industry, considering the finished stages of its products, has received more attention the past few years than that part relating to the heat treatment of steel. It is safe to say that prior to the war the term itself—heat treatment—meant little to the makers and forgers of steel. With the rush of orders to make guns, shell, various forgings and castings used on gun carriages, mounts, etc., came certain specifications that could be met only by the subjecting of the right material to the proper temperature, quenching and drawing.

For much of the practical knowledge of the subject pertaining to munitions we are indebted to the work previously done by our Allies, though our metallurgists and engineers, when the seriousness of the situation developed, again indicated that when it was necessary the word "failure" was not to be found in the vocabulary most of us use.

Growing Appreciation of Heat Treatment

Numerous instances might be related showing how we overcame obstacles that seemed insurmountable at the start, but such is not the object of this brief article. Many of the technical men in the steel trade knew, of course, what treatment by heat was necessary to bring certain desired results, and this knowledge was fostered by the growing progress made in metallography. Nevertheless, most of this information was considered secret, and outside of a few lines not much application was made by the average buyer of steel commodities.

Since the war there is a growing tendency to change this. The purchaser of a crankshaft, for instance, now specifies not only the chemical requirements but also the physical requirements, such as elastic limit, ultimate strength, elongation, hardness, etc., so that it becomes necessary to intelligently heat treat this crankshaft as well as to properly forge it from sound steel.

To carry out this procedure a little more knowledge of the subject becomes necessary than that which was possessed by the average "rule-of-thumb" man who had held sway in his generally solemn, silent way, and who held on to what information he did have to the discouragement of any one asking questions about his work. These old-timers are still to be seen in some places. While in many cases they were highly skilled, their work very often lacked uniformity. With the growing use of pyrometers, that are taking the place of judgment of temperature by color, it soon dawned upon the intelligent manager that heat treatment was not necessarily as complicated as it had been considered, and that a combination of theoretical knowledge and common sense would solve the problem.

Temperature as Related to Size

There is one branch of the subject, however, that still depends to a great extent upon experience, and this is the relationship between temperature and size of the articles to be heat treated. The

following examples have been taken from actual practice, and may prove of interest. In all cases where reference is made to a test piece the size of the latter is 1 in. square by 5 in. long. The quenching medium in all cases was water, which could be circulated in the quenching tank, but not as rapidly as is to be desired. Test pieces were quenched in standing water. All temperatures are Fahrenheit.

A very marked effect of size upon the physical properties of steel, as brought out by the heat treatment, was noticed on a steel having the following analysis:

C.	Mn.	P.	S.	Si.	Cr.	V.
0.32	0.64	0.018	0.039	0.25	0.65	0.16

The forging in question was 5 in. in diameter and 6 ft. in length. The test piece was given the same heat treatment, but for a shorter period as the forging itself, after the latter had been properly annealed. After heat treatment of the forging a second test piece was taken immediately adjoining and parallel to the first test piece. The forging was then re-treated and a third test piece taken from the same place. The results were:

	Elastic limit	Tensile strength	Elongation in 2 in., per ct.	Reduction of area, per ct.
Separate test piece, †Q. 1610 (20 min.), D. 1240 (20)	114,000	130,000	23.50	60
*Second test piece, Q. 1610 (1½ hr.), D. 1240 (1½ hr.)	67,000	94,000	22	55
*Third test piece, Q. 1660 (1½ hr.), D. 1240 (1½ hr.)	86,000	111,500	22.50	56

*From forging. †Q=Quenched; D=Drawn.

A nickel-chrome steel showed the same tendency. It analyzed:

C.	Mn.	P.	S.	Si.	Ni.	Cr.
0.35	0.53	0.008	0.027	0.20	3.48	0.51

A preliminary test was made on a piece of this steel 5 in. x 5 in. x 5 in. After annealing, this block was heated to 1475 for 35 min., quenched, and drawn to 1070. Results were:

	Elastic limit	Tensile strength	Elongation of area	Reduction of area
Transverse	120,000	130,500	7	22
Longitudinal	125,000	134,000	18	58

From the same ingot a large rod was forged 12 in. in diameter, weighing a little more than two tons. The results after heat treatment—this rod was annealed after forging—were as below:

	Elastic limit	Tensile strength	Elongation of area	Reduction of area
Q. 1525 (2¼ hr.), D.				
1070 (2¼ hr.)	74,500	109,000	15	42
Q. 1600 (2¼ hr.), D.				
1070 (2¼ hr.)	81,000	114,000	16	44

These two tests were longitudinal, and cored from the same end of the rod. As one result was within specifications required, while the other was under, the importance of this difference in heat treatment becomes apparent. In a similar case, previously using this same steel, the second treatment was the same as the first except that the rod was normalized before the re-treat, and almost an hour added to both the quenching and the drawing heat, but results showed a difference practically negligible.

Results on Hollow Forging

To show in another way that size bears a definite relation, the following results of certain hollow

*Metallurgist, National Forge & Tool Co., Irvine, Pa.

bored forgings are given. These were 4 ft. long, with an outside diameter of $2\frac{1}{2}$ in., the inside diameter was $1\frac{3}{8}$ in. The analysis of this steel showed:

C.	Mn.	P.	S.	Si.	Ni.	Cr.
0.36	0.60	0.011	0.024	0.14	2.70	0.77

The heat treatment of a preliminary test piece was the same as the forgings themselves; annealing preceded heat treatment. The results were:

Test piece, Q. 1500, D. 1120	Elastic limit	Tensile strength	Elongation	Reduction of area
Forgings, Q. 1500, D. 1120	110,000	135,000	22	61
	111,500	131,500	20	59

Both tests were longitudinal. As the relative size of the forgings and the test piece was nearly the same, practically the same physical results were obtained.

Experiments were made with a plain carbon steel with an analysis of:

C.	Mn.	P.	S.
0.43	0.70	0.025	0.036

As in the previous case, the forgings were relatively small, being gear blanks 3 in. high and 6 in. in diameter. These forgings and test piece were given the same treatment, and showed little difference in physical properties:

Test piece, Q. 1510, D. 1310, transverse.	Elastic limit	Tensile strength	Elongation	Reduction of area
Gear blanks, Q. 1510, D. 1310, transverse.	58,000	86,500	21	42
	59,500	89,000	19½	44½

Another straight carbon steel with a higher carbon content was tried.

C.	Mn.	P.	S.	Si.
0.75	0.60	0.018	0.046	0.19

This was forged into blocks 4 in. x 4 in. x 5 in. Results from a test piece separately heat treated, but in the same manner as the blocks, were so similar to those of a block that only one set is given below:

Annealed, Q. 1475, D. 1000	Elastic limit	Tensile strength	Elongation	Reduction of area
Annealed, Q. 1475, D. 1100	111,000	163,000	13	36
Annealed, Q. 1475, D. 1200	96,000	143,000	18½	49
Annealed, Q. 1475, D. 1200	87,000	125,000	19	48
Annealed	52,000	104,000	22	42

A straight nickel steel of the following composition is next noted:

C.	Mn.	P.	S.	Ni.
0.42	0.59	0.029	0.017	2.99

A test piece after annealing was quenched at 1465 and drawn at 1270 and when pulled it showed:

Elastic limit	Tensile strength	Elongation	Reduction of area
81,000	111,500	27	52

Forgings from the same ingot weighing about 175 lb. each were given the following treatments, the period of the quenching heat and the drawing being the same in both cases:

Q. 1465, D. 1270	Elastic limit	Tensile strength	Elongation	Reduction of area
Q. 1540, D. 1270	64,000	94,500	26	49
	75,500	105,000	25.50	44

Again in this case one test failed to meet specifications while the other was satisfactory.

Electric Alloy Steel

An electric alloy steel was forged into two blocks of the same size, annealed but given different heat treatments, the length of time, however, being the same. The analysis was:

C.	Mn.	P.	S.	Ni.	Cr.
0.59	0.58	0.014	0.021	1.42	0.57

Results from these two blocks, which measured 12 in. x 14 in. x 12 in. and a test piece of the same ingot and the same forging follow:

Test piece, Q. 1470, D. 1120	Elastic limit	Tensile strength	Elongation	Reduction of area
Transverse	138,000	151,000	9	21
Longitudinal	135,000	147,500	16	49
Forging No. 1, Q. 1470, D. 1120				
Transverse	72,000	112,000	10	22½
Longitudinal	72,500	112,000	15	47
Forging No. 2, Q. 1540, D. 1300				
Transverse	76,000	114,500	19	39

Experiments as to Hardness

Some experiments were made in this connection with respect to hardness. First a plain carbon steel, the same heat specified above containing 0.75 per cent C. was forged into a block 14 in. x 16 in. x 18 in. A test piece from this block, after it was annealed, was quenched from slightly above the critical temperature. It then showed a scleroscope hardness of 74 to 75. The block treated the same way proved to have a hardness not over 48.

An alloy steel showed the same tendency. It analyzed:

C.	Mn.	P.	S.	Ni.	Cr.
0.58	0.58	0.024	0.020	1.44	0.55

The forging in this case was 8 in. x 10 in. x 12 in. The preliminary test piece when hardened gave a reading of 71 to 73 on the scleroscope while the block treated the same way gave a rating of 48 to 50. It became apparent that a more pronounced quenching was necessary to bring out a greater hardness rather than to exceed the critical temperature too greatly, as in the latter case the nature of the forging may cause cracking more easily.

Another electric steel was forged from a 19-in. square ingot into a block 14 in. x 15 in. x 16 in. The analysis was:

C.	Mn.	P.	S.	Si.	Ni.	Cr.
0.48	0.67	0.014	0.015	0.18	1.99	.81

A piece of the forged ingot one-fourth of the size of the finished block was heat-treated at the same time. When both were tested for hardness, the smaller piece gave a rating 26 per cent greater than that of the finished block. The other physical qualities were:

Transverse	Elastic limit	Tensile strength	Elongation	Reduction of area
	177,000	202,800	6	8

Conclusions

The results above tabulated are a few of many showing the same general characteristics. So the conclusion is drawn that in actual practice large forgings require considerable judgment in determining the heat treatment in order to bring desired results. This seems to apply to both the quenching heat and the drawing heat, and mostly experience seems to decide how much the theoretical range in temperature can be exceeded. Unfortunately in the above work no experiments could be made using different quenching mediums, nor could any metallographic examination be made.

The United States Civil Service Commission announces an open competitive examination for research metallurgical operators to be classified into two grades, the salaries in which range from \$1,500 to \$2,000, and from \$2,000 to \$2,500. Applications must be filed with the Civil Service Commission, Washington, by Aug. 12, 1919. There will also be examinations for mechanical inspectors for a vacancy in the Public Works Department, Navy Yard, Mare Island, Cal., at \$7.04 a day, the application to be placed by Aug. 19. A supervising draftsman is needed at the Bureau of Steam Engineering, Navy Department, Washington, application for examination to be filed by Aug. 19. The pay is \$12.80 or \$13.60 daily. There is also a call for several kinds of draftsmen, male and female.

Threats of Nation-Wide Steel Strike

Representatives of Twenty-four Unions Decide to Demand Vote—Reports to Washington Indicate Serious Unrest—Continued Troubles in New England

WASHINGTON, July 15.—Threats of a nation-wide strike in the steel industry to force the abolition of the open shop in the industry are crystallizing into action. Representatives of 24 affiliated international unions in this industry met in Washington last Friday and decided to demand a strike vote by the membership of their unions. Further action is to be taken at Pittsburgh next Sunday. For some time, the union leaders have been trying to force the recognition of their unions by the various steel companies, chiefly the United States Steel Corporation, and even President Samuel Gompers of the American Federation of Labor has made a personal appeal to E. H. Gary, chairman of the board of the Steel Corporation, to secure this recognition. Sometime ago, it was announced that the unions were preparing for an open fight on the subject. Among the interesting features will be the attitude of the Department of Labor here at Washington. During the war there were repeated charges that the department looked with favor upon the pro-union activities of many of its members, especially in the campaigns which were being conducted to organize the steel industry. John Fitzpatrick of Chicago, who was the "labor" candidate for mayor of that city in the spring election, presided over the Washington meeting. G. B. Foster of Pittsburgh was secretary, and the headquarters of the special committee which is doing the organizing for the strike is in the McGee Building, Pittsburgh.

The following is the resolution passed at the Washington meeting:

WHEREAS, working conditions in the steel industry are so intolerable and the unrest arising therefrom so intense that they can be remedied only by the principles of collective bargaining; and

WHEREAS, all efforts have failed to bring about a conference between the heads of the great steel corporations and the trade unions representing many thousands of organized steel workers for the purpose of establishing trade union conditions in the steel industry; therefore, be it

Resolved, That the national committee for organizing iron and steel workers recommends to its 24 affiliated international unions that they take a strike vote of their local unions throughout the steel industry; and be it further

Resolved, That a special meeting be held in the Pittsburgh Labor Temple, July 20 at 10 a. m., of representatives of all the cooperating international unions for the purpose of taking action on this matter.

Labor conditions throughout the country are marked by serious unrest according to the reports which have been received by the Department of Labor. In many cases this unrest has become acute, and strikes are a feature of the industrial situation in almost every center.

These reports are embodied in the final statement of the United States Employment Service, which has at last decided that its weekly compilation of labor statistics are too fragmentary to be of value. It complains also that the \$400,000 to which Congress had reduced its request for \$4,000,000 left it without sufficient funds to continue the census taking operations. They are now to be dropped. The last report to be issued covers the week ending July 5. It announces a surplus of 177,392 workers in 80 cities, against 211,290 in 96 cities in the preceding week. As 100,000 of this surplus is credited to New York and 30,000 to Chicago, this would leave only 47,000 for the remaining cities that are listed.

Far more interesting than the statistical data are the reports of industrial difficulties. Molders are striking at Syracuse, N. Y.; boiler makers and molders at Akron, Ohio, and molders and coremakers at Cleveland. Los Angeles, Cal., reports acute industrial relations and the

same report comes from Portland, Ore., Seattle, Wash., and Little Rock, Ark. Boston reports conditions as "unsettled."

Wages of Sheet and Tin Mill Workers Reduced

YOUNGSTOWN, OHIO, July 15.—Sheet and tin mill operatives will sustain another wage reduction during July and August as a result of the bi-monthly examination of selected sales sheets in this city July 12. The average price of Nos. 26, 27 and 28 gage black sheets shipped by the mills in May and June was found to be \$4.35 per 100 lb. This will effect a reduction of 4½ per cent in the wages of sheet mill hands, as compared with the rate in May and June. At the May settlement the average price of black sheets of 26, 27 and 28 gage was \$4.50, and the latest examination discloses therefore a reduction of 15c. per 100 lb.

The average price on shipments of tin plate per base box during May and June was \$6.90, as against \$7.15 for March and April. This reduction of 25c. per base box means a reduction of five per cent, for tin mill workers. During the Atlantic City conference to establish an annual wage scale, which fixes a basis for the bi-monthly settlements, the sheet mill crew, except the roller, heater, rougher and shearsman, received an advance on the base rate of from 5 to 10 per cent. The reduction of 4½ per cent is therefore a full loss for the higher paid men and takes away for the two-month period about half the increase granted those lower paid.

This is the third wage cut this year in both the sheet and tin divisions, the first one coming at the March settlement, when sheet operatives were cut 10½ per cent and tin mill hands 8 per cent. At that time, the settlement was based on an average selling price of \$4.90 for sheets and \$7.45 for tin plate.

Meets Committee from All Employees

WORCESTER, MASS., July 14.—The strike of the 1500 employees of the Graton & Knight Mfg. Co., manufacturer of leather belting and leather specialties, assumed an unusual form in the negotiations attending it. The employees, unionized as members of the Leather Workers' International Union, demanded recognition of the union, a 48-hr. week, time and a half for overtime and equal pay for equal work of men and women. A committee of the union, headed by a leader from outside the city, attempted to present these demands, but the company officials refused to receive them, or to deal with the union in any way. The strike followed, beginning July 7, and some disorder resulted in the vicinity of the works, which was shut down completely excepting for a relatively small number of men employed in looking after hides in process in the tannery. There entered into the situation representatives of the Department of Labor and the Massachusetts State Board of Conciliation and Arbitration.

The Graton & Knight Co. did not object to collective bargaining as a principle; it was willing to deal with its employees as a body. Had they organized an association comprising every member of the working force, and had then sent a committee of the association to present a request for those changes embodied in the union demands, the committee would have been received.

This is really just what happened on Thursday. A committee of the employees, including union men who were on strike, and non-union men who were still at work was received by the company officials, the representatives of the Department of Labor and the State Board of Conciliation and Arbitration being also present. Previous to the strike, in fact previous to any action by the employees, the company had voluntarily

announced that the works would go on a 50-hr. week. The new State law governing the hours of labor for women and children is about to go into effect, so that the 500 women among the strikers would automatically go on a 48-hr. week basis. At the conference the company agreed to time and a half for overtime, equal pay for men and women for equal work, and no reduction in pay to result from the shorter hours. But the 50-hr. week was adhered to, because such is the standard schedule in belt manufacturing plants. The necessary continuity of labor in some departments makes that the logical week.

The meeting of the union on that evening declined to accept the terms offered, not to the union but to the employees as a body, but the action was not final. It is hoped that favorable action will be taken this week. A curious fact is that the organizers, professional labor leaders at whose instance the strike was called, favor the acceptance of the company's offer, even though the offer embodies in no way recognition of the union. The obstacle in the way is the attitude of the strong alien group of employees, who profess the desire to continue the strike, when, as far as conditions of labor and of wages, the only difference between demands and offer is the two hours a week for males.

Violence at Worcester

The strikes in progress in Worcester, Mass., are accompanied by much violence, and the manufacturers complain that the men who remained at work and those who have since taken the place of strikers receive scant protection from the local police force. Last week a large number of representative manufacturers, including not only those who have strikes on their hands, but industrial employers generally, called on Mayor Holmes, appealing for protection. They related the frequent assaults on their men, some of which had rather serious results, and the continued persecution of the families of workers, including threats of violence communicated to wives and children. So-called "strike-breakers" are searched by the police for hidden weapons, but the strikers are not molested. No weapon is permitted for defense, but no precaution is taken that weapons shall not be used for offense. These facts were laid before the mayor and the chief of police, who was also present, and the promise was made that the utmost possible protection will be given. The chief sufferers are the men employed in the local foundries, in most of which strikes are in progress. The owners are making gain in their working forces, which seems to act to increase the bitterness of the attack.

Building Houses for Workingmen

The response to the plans of the Worcester Housing Corporation for building large numbers of houses to relieve the famine in home places in Worcester, Mass., is in excess of the expectations of the officers, who are prominent manufacturers, most of them in metal lines. Even now, before plans are ready, over 110 applications to purchase have been received, for the most part from employees in the plants of the stockholders. The original idea was to build 50 three-tenement houses as a beginning, but the response has been so great that the initial contracts will call for more than that number of the three-apartment houses, and in addition a group of seven two-family houses of handsome design will be erected on what seems the most desirable tract of those that have been purchased, on the west side of the city on Park Avenue, with the Worcester Polytechnic Athletic field across the street, and one of the finest of the city parks at one side and at the rear. On this land in addition to the two-family houses will be constructed more than 15 three-tenement houses. A large number of fine trees stand on the premises, and all of these will be preserved, and in addition each house will have a lawn at front and sides and a garden plot in the rear, and shrubbery and young trees will be set out by the Housing Corporation. The entire group of buildings will be of stucco; the architects are those connected with the United States Housing Cor-

poration. Other tracts of land have been purchased in various parts of the city, and still others will be acquired shortly. The purchasers will pay a relatively small sum down, and give a first and second mortgage, the latter to be held by the Housing Corporation.

The assumption of the men interested in the corporation that their example would be followed by others has proved to be correct, for a stimulus has been given to building of houses to rent for low figures, and as a consequence the shortage of homes in Worcester promises to be rectified before winter sets in. The corporation will let its contracts very soon, so that the building plans, as already announced, will be completed in the autumn.

Good Effects of Music

Music is proving an incentive to increased production at the plant of the Burroughs Adding Machine Co., Detroit. Once a week, every Wednesday noon, from 12 to 12:30 o'clock, employees join in taking part in a concert in a centrally located room provided for that purpose. The program is conducted under the direction of the plant musical director, and includes patriotic and other popular songs, the words of which are placed on a screen. From 1500 to 2000 of the employees, both men and women, heartily take part in the program and enjoy this noon-time diversion from their work.

During the Tuesday and Friday noon hours, the plant band of 30 pieces gives a 30-minute concert and the plant orchestra plays once a week in the cafeteria during lunch time. During another noon hour, moving picture films are presented. These include instructive plant views, travelog and other pictures.

The musical programs put the employees in a good mood, and the management finds that production has improved during the afternoons after the singing and band concerts. The policy of the company in its welfare department has for a long time been to foster the spirit of comradeship among employees, interest in and attachment to the organization and to make the employees all feel that they are part of one big family, and the primary purpose of the musical programs during the noon hour is to foster this spirit.

Buffalo Firm Shares Profits with Employees

The growing tendency of employers to share profits with their employees or to give them an opportunity to buy shares in the business is illustrated by the incorporation of Beals, McCarthy & Rogers, the oldest continuous partnership in Buffalo, which has perfected arrangements to allow the department heads and principal employees to acquire an interest in the company.

The incorporation papers fix the capital stock at \$1,000,000 and give the corporate name as Beals, McCarthy & Rogers, Inc., the title assumed two years ago, when the name was changed from Beals & Co., as it had been known for 26 years.

The firm was organized in 1826, when Buffalo was a mere village, by Samuel F. Pratt and Edward P. Beals, under the name of Pratt & Co. It occupied modest quarters at 220 Main Street. From that beginning the firm's growth has continued until it is one of the largest iron, steel and hardware supply houses in the country.

Accidents Reduced

WASHINGTON, July 15.—The Bureau of Labor Statistics has worked out two highly interesting tables of the details of the frequency of accidents in the iron and steel industry during the years 1913-1918. The most significant feature of the compilation is the steady reduction in these accidents, declining from 181 per 1000 300 day workers in the industry in the year ending December, 1913, to 86.7 in the year ending December, 1918.

Puddlers' Wages Are Reduced

The Reading Iron Co., Reading, Pa., has announced a new wage rate for puddlers, effective July 7, of

\$10.50 a ton, a reduction from \$14.57½, the rate established by the War Labor Board. The ruling of the board expired Feb. 5, last, but the company has maintained the rate until this time. Two Eastern bar iron rolling mills, those of the Bethlehem Steel Co. and the Lebanon Valley Iron & Steel Co., which reduced puddlers' wages to \$9.25 a ton about two months ago, are still shut down on account of strikes. No solution of the controversy is yet in sight. These mills are not governed by the Amalgamated scale.

In the Labor World

Following a shut-down for about six weeks, due to a strike of 6000 employees at the works, the Los Angeles Shipbuilding & Dry Dock Co., San Pedro Harbor, Los Angeles, Cal., resumed operations, July 9, with the men returning to work. The strike was declared owing to an alleged violation of seniority rules in discharging men at the plant.

Employees of the John Wood Manufacturing Co., Consohocken, Pa., are voting upon the proposition of working three 8-hr. instead of two 12-hr. shifts. The decision will be announced during the week.

Following a shut-down owing to strike of employees, the Reading Iron Co., Reading, Pa., resumed operations at its blooming and finishing departments, July 8. The puddlers are still out and this department of the works has remained closed. The company has announced its intention of reducing the present puddling rate of pay from \$14.37 to \$10.50 per ton, maintaining that the cut was unavoidable if the plants were to continue operation.

Governor Sproul, Pennsylvania, has approved of the Workmen's Compensation bill, recently passed by the state legislature. The measure increases the rate of compensation to 60 per cent, establishes a new basis of computation for determining the average weekly wage, using the actual number of days engaged instead of 5½ days, as heretofore, reduces the waiting period to 10 days and provides for free medical attention for 30 days.

Commissioner Charles Bendheim of the U. S. Department of Labor, has been unable to effect settlement of the strike of employees of the Savage Arms Co. at its Sharon, Pa., plant. The men walked out when the company adopted a piecework system, instead of paying a daily wage as heretofore. The company is endeavoring to maintain operations by hiring other employees. A number of foremen left the plant when asked to man the machines.

W. P. Champney, president Eberhard Mfg. Co., Cleveland, manufacturer of malleable iron castings, has taken out group insurance for the employees of the company with the Travelers Insurance Co. All employees who have been with the firm for three months or more are insured for \$500 and those of five years standing receive \$1,000.

The office of the Director General, U. S. Department of Labor, is sending to employers a pamphlet dealing with "Treatment of Industrial Problems by Constructive Methods." Accompanying this pamphlet is a chart showing the various subdivisions of the Department of Labor and the details handled by them. The working conditions service of the department is intended to offer a constructive plan for reducing industrial accidents and sickness and to render assistance in making better working conditions.

At the present rate of wage distribution, the consolidated payroll for Youngstown, Ohio, in 1919 will total \$100,000,000. For the first half the disbursement exceeded \$42,300,000. The June distribution of \$6,530,816.35 was \$261,569 in excess of that for May. The January payroll of \$8,526,649.64 was the largest this year.

Molders employed at the Mahoning Foundry Co.,

Youngstown, Ohio, have gone on strike for a wage increase from \$6.12 to \$7 per day. J. W. Long represents the company in conferences with the men.

Molders employed at the Deming, Silver and Buckeye Engine companies at Salem, Columbiana County, Ohio, are on strike for a wage increase from \$5.50 to \$6 per day. They walked out July 8.

The Youngstown Sheet & Tube Co. has received a certificate from the War Department awarded for reinstating or returning to employment all of its employees who served in the war.

OFFICE CHANGES

A co-operative branch office of the bureau of foreign and domestic commerce of the department of commerce for the Pittsburgh district was opened at the Pittsburgh Chamber of Commerce on Monday, July 7. R. J. Seaman, manager of the bureau of foreign and domestic trade of the Chamber of Commerce, is in charge of the new branch, the establishment of which is regarded as the first recognition by the Government of the proposed new metropolitan district of Pittsburgh. This proposed district has an irregular radius of about 40 miles and embraces Allegheny, Westmoreland, Fayette and Washington counties, as well as parts of Armstrong, Butler, Beaver, Lawrence and Green counties in Pennsylvania, and portions of the Panhandle counties of West Virginia.

The Blaw-Knox Co., Pittsburgh, works Hoboken, Pa., has opened a new office in the Little Building, Boston, in charge of A. W. Ransome, formerly of the New York office, and has also opened a new office in the Owen Building, Detroit, in charge of H. J. Besson, who has been transferred from the Pittsburgh office to assume the duties of manager of sales of the Michigan district.

The National Tool Co., Cleveland, has recently opened a New York sales office in Charge of E. S. Chamberlain at room 553, 50 Church Street. The location of the company's Philadelphia branch office, where stock is carried, has been changed from 11 North Sixth Street to 40 North Seventh Street. That branch is in charge of H. L. Mather.

Scovell, Wellington & Co., certified public accountants and industrial engineers, announce the removal of their New York office from the Woolworth Building to larger quarters on the seventeenth floor of Lord's Court Building, 27 William Street.

The Hall Air Lock & Railroad Supply Co. has established a branch office in Milwaukee, occupying ground floor space in the Hotel Medford Building, Third and Sycamore Streets. The company is installing five large units in the Milwaukee yards of the Chicago, Milwaukee & St. Paul. An official inspection and demonstration is being arranged.

The Bossert Corporation, Utica, N. Y., manufacturing sheet metal stampings, has opened an office in Cleveland. The office at 611 Citizens Building will be in charge of the western sales manager, W. W. Vesey.

The Edison Storage Battery Co. has removed its district office in Pittsburgh to the Union Arcade Building, room 431.

The Kirby Coal-Iron-Marine Co. announces the opening of its New York offices at 511 Fifth Avenue. Other offices are maintained in Paris, Rome and Milan. Hugh Lee Kirby is president.

The Gale-Sawyer Co., tool maker, Boston, has opened an office in Room 601, Temple Building, 27 Monroe Street, Detroit, in charge of E. H. Anthony.

Investigation of Basing System to Be Made

Judge Gary Says It Would Be a Gigantic Task,
But He Favors It—Preliminary Hearing by
the Federal Trade Commission at Washington

WASHINGTON, July 15—Investigation by the Federal Trade Commission of the method of basing steel quotations may result in forcing the adoption of an f.o.b. mill base rate. This opinion was expressed by Judge E. H. Gary during a preliminary hearing on July 9 before the commission, at which he joined with John S. Miller, of Chicago, attorney for the Western Association of Rolled Steel Consumers, in asking that a thorough inquiry be undertaken.

While the Western steel fabricators are asking merely for a Chicago base in addition to the present Pittsburgh base, Judge Gary pointed out that it would be difficult to stop there. Manufacturers of steel products near the Birmingham mills, he said, would be certain to come before the commission and ask that that city be made a basing point. Pueblo, he said, might ask similar recognition. The result, he believed, in case the present system is declared inequitable, would be to base quotations on each mill, wherever it may be located.

That the case would be as far-reaching in its scope and as important as any ever considered by any judicial tribunal was asserted by Judge Gary. He pointed out that the prosperity of entire communities is involved, the establishment of mills at some points, such as Duluth, where costs are higher than elsewhere, having been made possible by the Pittsburgh base system.

Speaks for Corporation

Mr. Gary made it clear that he spoke only for the United States Steel Corporation. He said most of the other steel producers were opposed to any change in the basing method. For his own part, he said, he did not take sides one way or the other, but felt it would be a good thing to have the Federal Trade Commission thrash out the whole question thoroughly and establish a permanent policy.

Technically the investigation has not yet been decided upon by the commission. Expressions of Commissioners Victor Murdock, W. B. Colver and Huston Thompson, who heard Judge Gary and Mr. Miller, during the course of the discussion made it appear certain that the inquiry would be undertaken. The informal hearing on Wednesday was in advance even of the filing of an application in the manner prescribed by law. The commission instructed Mr. Miller to prepare such an application, naming the steel mills as respondents. Mr. Miller said that the only mills against which his clients had a grievance were those in the Western territory, but Commissioner Colver told him it would be preferable if he broadened his application in such a way as to include all steel mills throughout the country.

Mr. Miller said he expected to file the application within about a week. Following that, the commission will conduct a preliminary inquiry with a view to determining whether it should issue a formal complaint in accordance with its practice. If the formal complaint is entered by the commission, then the real investigation starts. This will take six months or a year, the plan being to hear the steel producers, manufacturers of steel products, chambers of commerce, and representatives of communities.

There was some discussion as to just how much of an investigation should take place between the filing of

the application and the issuance of a formal complaint. Commissioner Murdock said that in view of the fact that moral turpitude on the part of the steel producers was not involved, he was reluctant to sign a formal complaint in the manner prescribed by law, unless he was convinced there was a good reason for it. Judge Gary favored conducting as much of an inquiry as possible before the issuance of a formal complaint, on the theory that the document stands as a severe indictment of the defendants and brands them before the public as violators of the law, when as a matter of fact, so far as this particular case is concerned, it would not be intended to give that impression.

Savage Complaint Proposed

Commissioner Colver inclined to the opinion that if the commission assumes jurisdiction it could not do otherwise than issue a "savage" formal complaint, after a preliminary inquiry and in advance of complete hearings.

The question of jurisdiction was discussed at some length. The case being considerably different from those ordinarily handled by the commission, it was desired to fix upon the precise section of the law that would apply. In this case, it was pointed out, unfair practices are not alleged by the Western fabricators against their competitors, the fabricators in the East, but rather upon the mills that serve both groups.

Mr. Miller said he believed the commission had jurisdiction under both the Clayton law and the Federal Trade Commission act. Members of the commission appeared to agree with him, Mr. Colver inclining to the view that the Clayton law covered the case, while Mr. Murdock believed the Federal Trade Commission act hit it more closely. Mr. Miller thought it unnecessary to segregate one act from the other inasmuch as the commission has jurisdiction in both instances.

The provisions referred to were section 2 of the Clayton law, prohibiting price discriminations tending to restrict competition "in any line of commerce," and section 5 of the Federal Trade Commission act, referring to unfair competition. The phrase "in any line of commerce" was seized upon as applying to this situation where the restrictions of competition occur in a line of commerce, a step removed from the class of business accused of discrimination.

Mr. Miller's Statement

Accompanying Mr. Miller was H. A. Wagner, of Milwaukee, president of the Wisconsin Bridge & Iron Co., one of the members of the association he represents. Mr. Miller started the hearing by stating the position of the Western manufacturers.

"I represent an association of men known as fabricators of steel," said Mr. Miller. "Mr. Wagner, for instance, makes bridges out of steel bought from the Gary mills. He is situated at Milwaukee. Others are situated at other points in the Middle West. The association includes anybody who takes rolled steel and makes something out of it.

"During the war, steel was sold f.o.b. Pittsburgh and f.o.b. Chicago. Mr. Wagner could buy his steel f.o.b.

(Continued on page 205)

TRADE WITH GERMANY

Few Inquiries from Manufacturers Are Received in Washington

WASHINGTON, July 15—The resumption of trade relations with Germany, as a result of signing of the peace treaty, has aroused little activity in the Department of Commerce. Secretary Redfield explained that the department had received few inquiries from American manufacturers and exporters concerning trade opportunities in the Central Powers. He also declared that the correspondence of his office reflected a reluctance rather than a desire on the part of American business to renew trade relations with our late enemies.

As a result, no plans have yet been made to send official representatives of the department into Germany. The department's appropriation for the current fiscal year carries an allowance for a commercial attaché at Berlin. He will not be appointed, however, until diplomatic relations have been re-established. In the meantime, it is likely that he will be sent to The Hague. So far as general investigation of German trade relations is concerned, the department has made no plans. Commercial investigators now in Europe have made some reports concerning the commercial and industrial conditions in territory formerly part of the Central Empires. The territory directly under the control, however, of the new German and Austrian governments has not been touched.

Burwell S. Cutler, who has resigned as the director of the Bureau of Foreign and Domestic Commerce will sail for Europe on Friday to make a special study of the general commercial conditions. This is to be used as a basis for the assignment of investigators throughout Europe. At the time of his sailing, it was announced that Mr. Cutler would visit England, France, Belgium and Northern Italy. Later it was reported that he would probably extend his visit to Spain, and it was regarded as likely that he would make a trip through Germany before his return.

Of equal importance to American business, is the question of the resumption of postal relations with Germany. It was announced by the Postoffice Department that as soon as the State Department had announced the official termination of hostilities and the lifting of the blockade, mail would again be received for German addresses. For the present, however, these mails will have to be carried through Holland and Sweden and redistributed through those neutral countries. It was expected that this would enable the department to count on three sailings per month to both of these countries, but it would be likely that a letter would require at least three weeks for delivery in Germany. No special addressing, it was declared, would be required to carry letters to Germany. All the American correspondents would have to do would be to address the letter as in peace times, affix a five-cent stamp, drop it into the mail box and leave the rest to Uncle Sam.

Combination of French Steel Plants in Occupied Regions

WASHINGTON, July 15—Information has come to the Department of Commerce regarding the recent formation of an important new steel group in France. The associated firms are la Société Anonyme des Aciéries de Longwy; la Société Anonyme des Hauts Fourneaux, Forges et Aciéries de Denain et Anzin; la Société Anonyme des Usines de l'Espérance; la Société Anonyme des Aciéries de Micheville; la Compagnie des Forges et Aciéries de la Marine et d'Homécourt; la Société Métallurgique de Senelle-Maubeuge; Dorémieux Fils et Cie., a Saint-Armand-les-Eaux; la Société Anonyme des Boulonneries de Bogny-Braux; la Société en Commandite Lefort et Cie.

The name that has been adopted is le Groupement des Sinsitres du Nord et de l'Est. The nominal capital is 1,000,000 francs (\$193,000), and the offices are at

52 rue Taitbout. The group will deal in commercial, industrial and financial transactions for the purchase and sale of steel produced in the German works in Alsace-Lorraine and the occupied German territories, so far as their products come under French control. The object of the organization is purely national; it has been formed with Government approval after agreement between the proper ministries and the president of the society.

The Longwy company made 314,000 tons of steel in 1913, mostly in merchant bars, shapes, rails and plates. The Denain and Anzin company produced 396,000 tons of steel in 1913 in merchant bars, shapes, plates and rails. The Espérance works makes merchant iron and steel bars, steel sheets and horseshoes. The Micheville company made 309,000 tons of steel in 1913, over half of which went into rolled shapes and merchant bars. At the Homécourt plant, which is one of several of the company, were produced shapes, rails, plates and billets. Senelle-Maubeuge company makes shapes, merchant bars and rails. Dorémieux Sons & Co. make rolled iron products for shipping and railroad work and chains. The Bogny-Braux company has as its chief products bolts, rivets and the like, and rolled puddled iron, having a capacity of 10,000 tons of bolt products and 32,000 tons of rolled products. Lefort & Co. are makers of wire nails.

Perry, Buxton, Doane Co. Expanding

The Perry, Buxton, Doane Co., Boston, dealers in scrap iron and steel and metals, has increased its capital stock from \$850,000 to \$2,000,000, all of which is fully paid in, the purpose being to care for the financial needs of the growing business. Several changes have been made in the board of officers. Azro L. D. Buxton, Worcester, Mass., remains as president, B. H. Lester as first vice-president, and Gerge B. Doane as treasurer. In addition W. Vernon Phillips, Philadelphia, former secretary, becomes chairman of the board of directors, and C. A. Barnes second vice-president. Mr. Phillips has been during the war chief of the iron and steel scrap section of the War Industry Board. Mr. Barnes has been secretary of the committee on steel and iron scrap of the American Iron and Steel Institute, and previous to assuming that office was connected with Luria Bros., Lebanon, Pa. The company has opened an office in New York, with Lawrence May temporarily in charge, and an office has also been established recently in Milan, Italy. Branches are maintained in Philadelphia, Worcester and Chelsea, Mass., Hartford, Conn., Providence and Pawtucket, R. I., and Portland, Me.

Quarterly Report of Lackawanna Steel Co.

The second quarterly report of the Lackawanna Steel Co., the first by any steel company to be issued for that period, shows a deficit of \$233,086, contrasted with a profit of \$3,830,489 for a corresponding period in 1918. This report is considered significant as being the first to give concrete evidence of poor business during that quarter. Profits for the first half of 1919 were \$974,022, compared with \$6,782,834 for the corresponding period of the year before. Unfilled orders on June 30 amounted to 122,399 gross tons, or a decrease of 433,808 tons from that of the same date in 1918. The present six months' profit of slightly less than \$1,000,000 is a decline of more than \$12,000,000 from the figures for the first half of 1917. Total net earnings of all properties after taxes and expenses, including repairs and maintenance, though not renewal expenditures and other appropriations, amounted in the first half of 1919 to \$2,444,748, contrasted with \$8,406,428 for the similar period of the preceding year.

In THE IRON AGE of June 19 in an article referring to the Kiushu Steel Works, Yawata, Japan, an incorrect statement was made concerning the electrical equipment. The General Electric Co. furnished two 2000-hp. motors for the mills, with all auxiliary apparatus.

History of Buying Methods in War Time

Judge Gary Did Not Write Letter Attributed to Him by
Chairman Graham—Attorney General Said Question Was
One of National Policy—Creation of War Industries Board

WASHINGTON, July 15.—The text of the minutes of the Council of National Defense presented to the Congressional committee of which is investigating war expenditures, reveals the fact that E. H. Gary did not write the letter given out by Chairman Graham of this committee charging that business men who were members of the various war committees were violating the Sherman and Clayton laws. The letter which has caused so much comment was written by a manufacturer to Judge Gary and sent by him to the Council of National Defense.

Chairman Graham explains that he was misled by the punctuation in the minutes of the Council into believing that the letter came from Mr. Gary as chairman of the committee on steel and steel products of the advisory committee of the National Council.

When Judge Gary was in Washington last week, he called on Chairman Graham personally in connection with this matter. Judge Gary said he remembered writing no such letter. When Messrs. Gary and Graham found the original letter in the minutes of the Council meetings, the error was revealed. Judge Gary, however, declined to make public the name of the signer of the letter.

Minutes of the Council

The minutes of the Council of National Defense containing this letter follow:

"June 1, 1917. Commissioner Baruch read the following letter, of date May 31, 1917, from E. H. Gary, chairman of the committee on steel and steel production of the advisory commission:

I send you herewith copy of letter just received from one of the manufacturers in reply to our request for detailed information concerning the supply of ferromanganese on hand. I do not add the names. The letter speaks for itself. If there is any question in regard to these matters we should know it now.

The letter referred to by Mr. Gary reads as follows:

Ferromanganese consumption approximately 250 gross tons a month. Two months' supply on hand May 1. Contracts on open market for six to eight months additional. Do not use spiegel.

We are anxious to do everything we can to assist the Government, and have complied with their request for detailed information regarding all of our business, including the steel mill. We are very doubtful, however, how far it is safe or proper for us to cooperate with some of the committees that are endeavoring to assist in the matter. I was called to Washington a few weeks ago in connection with some of this committee work, and found that they were operating in flagrant disregard of the Sherman law, the Clayton law, and all the other statutes that are supposed to regulate business, particularly big business.

The Government officials who were sitting in at this conference admitted that they had no authority for doing so, and upon a little further inquiry we were advised that the Government officials' presence at the conference would not in any way protect us. As a matter of fact, we have recently made a settlement with the Treasury Department of a transaction which took place in 1903, notwithstanding the fact that the Government admitted that we acted in good faith at the time, and under the explicit instructions of the official representative of the Treasury Department. The present administration takes the position that the former contracts were wrong and not in conformity with the law; therefore we must be punished for doing exactly what we were told to do by the authorized representative of the department at the time.

It seems to us that if the Government desires co-operation on the part of the business interests in helping them with their problems, the least they could do would be to have Congress pass a resolution suspending operations of these laws during the period of the war. Until such time as such action is taken to protect us against prosecution in the future, we should prefer to do our bit by responding to the direct requests of the several branches of the Government for assistance, and this we are doing practically every day.

Appeal to Attorney-General

On June 17, 1917, according to the same minutes,

Commissioner Daniel Willard again read the Gary letter and its enclosure to the Council, whereupon the commission decided to send the letters to the Attorney General, "with the statement that the council and commission and the various committees acting thereunder are constantly encountering the difficulty referred to, and if there is any expression on the subject that the Attorney General can make, the council and commission will be glad of his helpful co-operation."

On June 18, 1917, the minutes of the Council of National Defense quoted the following reply from the Attorney General:

"I have your letter of the fourth instant transmitting a copy of a letter from Mr. E. H. Gary, chairman of the committee on steel and steel products of the advisory commission, Council of National Defense, together with a copy of a letter from an unnamed manufacturer. You inquire whether the Department of Justice desires to express an opinion on the question raised by these letters.

"As I read the letters, the question raised is whether the operation of certain laws, more especially the Sherman law and the Clayton law, should be suspended by resolution of Congress during the period of the war. This is not a legal question but a question of national policy in respect of which I do not feel that I should now express an opinion unless requested to do so by the President."

No action was taken by the Council of National Defense on the question raised by the letter submitted by Judge Gary.

"Afterwards," said Chairman Graham to his committee in reading these minutes, "when there was evidently a discussion in Congress as to the illegality of members of committees on the council buying from themselves, the council discussed this general policy, and it was suggested that 'This embarrassment might be removed by the plan of the committee reorganization now under consideration.' Afterwards the minutes show that on account of this so-called embarrassment the War Industries Board was created, and committees appointed by the National Chamber of Commerce, so that the letter of the law might be complied with, but by which scheme no part of the method of buying was changed in the slightest degree, so far as I can observe."

The War Industries Board

The minutes of the Council of National Defense for June 18, 1917, show that discussion was had of the general policy to be followed in awarding Government contracts upon the recommendation of the various subcommittees of the advisory commission, members of which might have business affiliations with a particular firm recommended for a particular contract. It was suggested that this embarrassment might be removed by the plan of the committee reorganization then under consideration and action was accordingly deferred pending such reorganization.

The minutes of July 28, 1917, show that the reorganization plan, which was finally approved, was in the following form:

"The Council of National Defense to-day decided, with the approval of the President, to create a small body to be known as the War Industries Board. The War Industries Board, in addition to other duties, will assume those formerly discharged by the General Munitions Board. The new board will be composed of seven members, working under the direction and control of the Council of National Defense and responsible through it to the President. Its members will be direct representatives of the Government and of the public interests. It will be composed of F. A. Scott, chairman; Lieut. Col. Palmer E. Pierce, representing the Army; Rear

Admiral Frank F. Fletcher, representing the Navy; Hugh Frayne, B. M. Baruch, Robert S. Brookings, and Robert S. Lovett. * * *

The Council of National Defense and the Advisory Commission continued unchanged and discharged the duties imposed upon them by law. The committees before that created immediately subordinate to the Council of National Defense, continued their activities under the direction and control of the council. Those whose work is related to the duties of the War Industries Board co-operated with it. The sub-committees advising on particular industries and materials, both raw and finished, heretofore created, also continued in existence and were available to furnish assistance to the War Industries Board.

The director on Sept. 5, produced a copy of a letter of date Aug. 29, 1917, from the Attorney General to the chairman of the War Industries Board, answering questions arising under section 3 of the food and fuel control act. The director was requested to furnish each member of the council with a copy of the letter and he submitted the following memorandum which was approved:

Functions of Advisory Committees

"The functions of advisory committees of industry are to advise and furnish information to the director of the Council of National Defense, the War Industries Board, any member or employee thereof, either upon such committee's own initiative or when called upon to do so, regarding the industry in its relation to the war needs of this Government and the Allied Governments.

"In accordance with section 3 of the food and fuel control act, approved Aug. 10, 1917, no person connected with the Council of National Defense, the ad-

visory commission or any co-operative committee or board thereof must:

"(a) Solicit, induce or attempt to induce any person or officer authorized to execute or direct the execution of contracts in behalf of the United States, to make any contract or give any order for the furnishing to the United States of work, labor or services or of materials, supplies or other property of any kind or character, if such person connected with the Council of National Defense, the advisory commission, or any co-operative committee or board thereof, has any pecuniary interest in such contract or order or if he or any firm of which he is a member, or corporation, joint-stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto.

"Note—Advising and furnishing information to the director of the Council of National Defense, the War Industries Board, or any member or employee thereof, does not violate this section, as these agents are advisory and do not execute or direct the execution of contracts for the Government.

"(b) Make or permit any committee or other body of which he is a member to make or participate in making any recommendation concerning any contract or order in which he is interested directly or indirectly, as already above outlined (a), to any council, board or commission of the United States, or member or subordinate thereof, without making, to the best of his knowledge and belief, a full and complete disclosure in writing to such council, board, commission or subordinate of any and every pecuniary interest which he may have in such contract or order, and of his interest in any firm, corporation, company or association which may be a party thereto, nor shall he participate in the awarding of such contract or giving such order."

CLEVELAND COMPANIES MERGED

Otis Steel Co. and Cleveland Furnace Co. United —Affiliated with Large Ore Producer

A merger of the Otis Steel Co., Cleveland, with the Cleveland Furnace Co. has been effected as the result of a deal on which various interests have been engaged for several weeks. Control of the Otis company was acquired last May by William Salomon & Co., New York bankers, who purchased approximately 75 per cent of the capital stock, this being held by British stockholders, and it is announced that the present combination was contemplated when the English stock was bought. The combined plants will be operated as the Otis Steel Co. and the merger makes the Otis plant an affiliated interest of the Cleveland-Cliffs Iron Co., a leading producer of Lake Superior ores which, about three years ago, acquired control of the Cleveland Furnace Co. by the purchase of the holdings in it of Rogers-Brown & Co.

The present managements of the two merged companies will continue in active charge, taking a financial interest in the new company. It is officially stated that not less than 75 per cent of the stock of the Cleveland Furnace Co. has been acquired in the merger, but it is understood that approximately 95 per cent of the stock of the furnace company will be turned into the new company. The furnace company for the present, at least, will continue its corporate existence.

The board of directors of the new Otis Steel Co. will include William G. Mather, chairman of the board; George Bartol, president Otis Steel Co.; D. T. Croxton, president Cleveland Furnace Co.; Howard F. Deverell, secretary Otis Steel Co.; S. Livingston Mather, secretary, and H. A. Raymond Mather, manager of the ore sales department of the Cleveland-Cliffs Iron Co.; William B. Sanders, attorney, Cleveland; E. F. Wilson, superintendent Riverside plant Otis Steel Co.; John Sherwin, president First National Bank, Cleveland; Elisha Walker of William Salomon & Co., New York, and E. R. Tinker, vice-president the Chase National Bank, New York. Mr. Bartol will probably be elected president of the new Otis Steel Co.

The capital stock of the new company will consist of \$4,850,000 of 7 per cent cumulative preferred stock,

par value \$100, and 411,668 shares of common stock with no par value. According to the plans the company will retire its existing \$2,373,500 par value outstanding preferred stock and readjust the outstanding common stock. It is understood that the British stock of the Otis company was purchased at \$210 per share for the common and \$120 per share for the preferred stock. The authorized capital stock of the present Otis company was \$5,000,000 in common and \$5,000,000 in preferred. The Cleveland Furnace Co. has a capital stock of \$2,000,000, all common.

The Otis Steel Co. has been in operation in Cleveland for 46 years, having been organized in 1873. Its plant consists of its Lakeside Works and its Riverside Works, the latter built in 1913. Its Lakeside Works consists of three acid and five basic open-hearth furnaces, a 30-in. blooming mill, a 112 and 152-in. plate mill. Its annual capacity is 20,000 tons of acid and 90,000 tons of basic open-hearth ingots and 70,000 tons of sheared plates. In connection with this plant are two steel foundries, one for large and the other for light castings. The Riverside Works are equipped with an 84-in. tandem plate mill and three jobbing mills. This plant has an annual capacity of 65,000 tons of light plates and 35,000 tons of sheets. The plant of the Cleveland Furnace Co. includes two blast furnaces with an annual capacity of 250,000 tons and a by-product coke oven plant consisting of 100 Semet-Solvay ovens. The Riverside plant and that of the Cleveland Furnace Co. occupy adjoining sites on the upper Cuyahoga River, the two companies owning 350 acres. It is announced that no plans have been made for plant extensions, but it is believed that the company will eventually erect a steel plant including open-hearth furnaces and a blooming mill to form a connecting link between the two present plants and permit the conversion of pig iron from the blast furnaces into billets and sheet bars for the Riverside finishing mills.

A financial statement just issued, with the assets of the combined companies as of March 31, after making adjustments contemplated by the present financing, which included the introduction of about \$1,000,000 new working capital, shows total combined assets of \$25,167,000, and total liabilities exclusive of capital stock of \$5,246,377.

EUROPE'S INDUSTRIAL PROBLEM

A Cleveland Manufacturer Finds Conditions in England Full of Portent

THE IRON AGE is permitted to make extracts from some observations of E. S. Carman, chief engineer and secretary of the Cleveland Osborn Mfg. Co., Cleveland, on industrial conditions in the Allied countries of Europe. Mr. Carman returned a few weeks ago from a tour of Belgium, France and Italy and a considerable stay in Great Britain. What is given below is particularly noteworthy for its statement in epitome concerning phases of the situation on which others have written at great length with less illumination:

Can Belgium Regain Her Place?

"In France the people seemed to be enjoying their new found release from the bitter fighting of the past five years. They seemed happy, content and ambitious to take up again the life of peace and happiness.

"After visiting the northwest battlefields I left France for a time, entering Belgium. It was here that one asked the question, Can Belgium ever regain the industrial position she once held? Can she be a factor in the competition for the export trade of the world? Her industrial plants, stripped by the Hun, are as skeletons, standing upright in all their ghastly nakedness.

"We have heard and read of the wilful destruction of the cities and industrial plants of Belgium and northern France, but neither words nor pen can adequately convey to the mind the real conception of what the eyes can see and the heart can feel; for you must see with your eyes and hear with your ears before you can conceive of the completeness of the devastation that was wrought. Then, too, one sees there the human side of after-war, and if at all sympathetic his heart is deeply touched.

"I called on a former customer of ours at his office home in Brussels; a builder of large engines, both steam and gas, also general engineering work. I was shown into the office of the owner (a man about 60 years of age), and there, after I had convinced him that I was not trying to sell him something, but just sympathetically inquiring what I could do to help, he told me the story of his misfortune.

A Question as to Italy

"Italy has been a consuming nation, importing large quantities of food, clothing materials, and nearly all her iron and steel products of consumption. She has never been known as an industrial manufacturing nation, but it is my understanding that her after-war aspiration is to become a producer instead of a consumer. She feels that the mechanical experience gained in war time should enable her to manufacture and so she has continued and is producing several types of machine tools, hydro-electric power units, motors, etc. As a whole they are crude-looking in design and poorly built.

"It was my good fortune to visit many plants in all her large cities, excepting Venice, also a few of the royal navy yards and arsenals, including the largest. It was at this plant that I was shown the foundries, machine, pattern, boiler, plate and electric welding shops. These shops were furnished with only an average equipment and that did not seem to be producing an average output. This being the largest and best navy yard, I was beginning to wonder what the others would look like, when, much to my surprise, upon arriving at the shipyard and entering an enclosure, there lay before me on the ways a submarine just about ready for launching. It was the last of an order of six, about 20 ft. in diameter and 200 ft. long.

"We give the Italian credit for being an artist and

rightly so, but when we think of art we think of painting and sculpture, of palaces and song; but hardly do we expect to see such graceful lines and curves upon a submarine—an engine of destruction, built to fight against the Hun's devilishness. As I looked upon this thing of elegance and beauty, an artistic design with workmanship most skillful in the bending, shaping and riveting of the heavy plates, the American instinct within began asking the question, Was not this built to fight? Was not this built to win a war, and at a time when labor, capital and skill were in great demand? Why, pray tell me, why the utter waste of labor, capital and skill necessary to fashion these heavy plates in such an artistic manner? Would not a more simple design accomplish the same work?

"As one travels throughout Italy it becomes at once apparent that the business and home life of the Italians is one of ease, and primitive in manner and habits; there is not to be found the many conveniences and, in fact, the necessities of the American home and office; mechanical appliances in the everyday life are unknown. Labor is plentiful and cheap. Yet when output and cost are compared with ours their costs will doubtless be much higher than ours. Before Italy can export she must consume, and to teach her people to consume requires the changing of customs as old as history itself—a great task indeed.

France's Home Problems Many

"In France the condition is quite different. France has a people whose habits are advanced and her workmen know how to and can produce a day's work for a day's pay. There seems to be a willingness on the part of the workman.

"It was my privilege to be the first American civilian to inspect the greatly enlarged works of Schneider & Co. at Le Creusot. I have heard this company spoken of as the Krupp's of France and so it is, for on every hand was to be seen ordnance of all sizes and description. This great plant, which was responsible for the furnishing of much of France's war weapons, is now at work building instruments of peace and preparations are now being made to convert still more of its many shops to the manufacture of useful peace-time machinery.

"France is busily at work now; but France has years of work ahead to rebuild, repair and re-establish her industries and that, too, with over three millions of her best and most skillful workers either dead or disabled. Can France give attention to world trade? Not yet.

England Has Many Troubles Ahead

"And now, what about England? Yes, England has all that is necessary in the way of equipment to have and to hold the world's trade; but one thing she lacks—a willing labor. England's labor will not work, regardless of the rate of pay; the day's output is restricted and retarded. Her plants are not busy. Her labor is unemployed. Her masters are indifferent and I fear in many instances unconscious of the storm that will sooner or later break in great fury. We must look further back than the near past before we can begin to suggest the cause for all this present unrest. Europe's age-old curse, man and master, of snobbery and hatred, is at the bottom of all her troubles. She does not and will not recognize that all men have an inalienable right to earn a livelihood and pursue the paths of peaceful, honest and a happy living. Many of the masters of industry are autocratic, as are also the masters of labor. They are continually striving with each other.

"Can England be a factor in the race for world-wide commercial supremacy? Well, the question is a hard one to answer and I believe from observation we shall have plenty of time to wait for a reply. England has troubles of her own."

CORRESPONDENCE

Decimalizing the Inch

To the Editor: We have before us literature sent out by a society which is again advocating the adoption of the metric system, asking us to use our influence to help bring about legislation to this effect. We have written this society, stating that we are heartily in favor of a decimal system, but cannot altogether endorse the old metric system in full and particularly the meter, the metric unit of lineal measurement, on account of its inadaptability to a vast number of applications.

We suggested the taking of our standard inch and decimalizing it. The fractional parts of the inch are already decimalized, viz.: 0.1, 0.01, 0.001, and for these we have measuring instruments, such as micrometers and gages, also flat scales and rules that are graduated with tenths and hundredths.

Since the fractional parts are decimally established, why not establish divisions above one inch also on a decimal basis. This could very easily be done by having 10 in. equal a certain named length, and 10 of these lengths equal another named length, etc. By doing this our present measuring system would not be greatly revolutionized and the change would not affect lead screws and graduations on our many machine tools and small tools.

There are in the United States and Great Britain and other countries millions of dollars' worth of machine tools and gages built and graduated on the inch basis, and millions of dollars more worth of jigs and special fixtures in machine tool and tool builders' factories used to build standard tools that are all made to the inch standard. It would mean a tremendous loss and cost to manufacturers to abandon all these tools and to build up a new standard. It would be a most impractical thing to do.

By decimalizing our inch we could quickly get on a decimal basis at very little cost and inconvenience and would get a more practical lineal measuring system than the meter system would be. The great opposition which the majority of manufacturers have against the metric system is not against the principle of decimalization, but against the "meter unit" which is so difficult to change into inches. There is no great hesitancy in abandoning our feet, yards, rods, etc., but we must not, dare not and cannot abandon our inches.

The inch seems to be one of the most ancient units of lineal measurement. According to various authorities the unit of measurement used in the construction of the Great Pyramid, the oldest of the Pyramids in Egypt, was a unit which was just one thousandth inch longer than our present English inch. Be this as it may, manufacturers look at this from a practical and commonsense viewpoint and are desirous of getting the greatest convenience with the least cost and inconvenience.

The change we suggest would very little revolutionize our present measuring instruments, and it would not affect lead screws and graduations on any of our present machine tools. We would only need to abandon our present $\frac{1}{4}$ ths, $\frac{1}{2}$ ths, $\frac{1}{16}$ ths, $\frac{1}{32}$ nds and $\frac{1}{64}$ ths, and to this we feel sure very few would object.

To use the metric nomenclature we would suggest a table of lineal measurements as follows. The names, however, may be simplified or changed altogether:

	Inches
10 micrin, mon., equal 1 milin, equals....	.001
10 milin, mn., equal 1 centin, equals....	.01
10 centin, cn., equal 1 decin, equals....	.1
10 decin, dn., equal 1 inch, equals....	1.
10 inches, in., equal 1 dekin, equals....	10.
10 dekin, dkn., equal 1 hectin, equals....	100.
10 hectin, hn., equal 1 kiloin, equals....	1000.
10 kiloin, kn., equal 1 myrin, equals....	10000.
10 myrin, myn., equal 1 tele, equals....	100000.

The tele, which equals 1.578 miles, would be a con-

venient unit for distance measuring, and could replace our common mile of 5280 ft.

We submit the foregoing in the hope that it may help to prevent any serious movement to legalize the meter as a standard unit of lineal measurements.

E. S. MUMMERT,

Hanover, Pa., July 5.

President Mummert-Dixon Co.

American Machine Tools for China

To the Editor: The present time seems especially favorable for the introduction of American machinery and machine tools in China, because the erection of numerous textile mills, iron foundries, and a large variety of other industries shows that the country is apparently at the beginning of a very considerable industrial development.

Other countries are fully aware of the opportunity and British manufacturers have been arranging to supply their machinery gratuitously to the engineering college, which they have established in Hongkong, to a textile school in Shanghai, and to a number of Chinese industrial schools and other institutions, which require machinery and mechanical equipment.

The more intelligent Chinese consider that American machinery is very excellent in design, and superior in construction, and for that reason are especially anxious to equip their industrial schools with it, although it is difficult to do so owing to the universal lack of funds for such institutions.

It has been felt in the past that American machinery was not suited for the use of the Chinese, but this seems to be an error, as it is generally agreed among those who are employing Chinese in machine shops and mechanical work, that their intelligence, perseverance and manual dexterity quickly develop them into skilled mechanics under proper instructions. They are so adept and accurate in their workmanship that in France they were used for airplane work, which, of course, requires exceptional skill.

As the people are not accustomed to machinery, it will, of course, be necessary to teach them how to use these tools, and the best way seems to be through the industrial and manual training schools, many of which are even now in existence, and more will be founded.

It is unnecessary to say that the graduates of these schools will very naturally endeavor to have the machinery to which they are accustomed introduced in the factories in which they are employed, and as they are practically the only trained workmen available, they will have great influence in the selection of equipment.

The ordinary manual training school requires lathes from 12 in. to 14 in., and 16-in. lathes of the Gap type. Planers up to 24 in. x 24 in. x 48 in. are needed; and, also, 14 in. to 16 in. shaping machines and small mill-grinding machines, as well as small and medium universal grinding machines, wood turning lathes, small buzz planers, circular and band saws, and numerous small tools, such as are used in all shops.

We trust that you will decide to bring this matter to the attention of your readers in some way, as it seems very desirable that American manufacturers should be aware of the unusual opportunity, and of the way in which other countries are taking advantage.

It is hoped that some of the manufacturers of machinery will be interested enough in the matter either to present some of their machinery free to some of these schools, to loan it, or to sell it at reduced prices.

Kindly advise anyone who may be interested that the Bureau of Foreign and Domestic Commerce, and Julian Arnold, commercial attaché, Peking, China, will be very glad to supply any other particulars that may be desired and to co-operate in every way.

F. R. ELDRIDGE, JR.,
Chief, Far Eastern Division.

July 9, 1919,
Bureau of Foreign and Domestic Commerce,
Washington.

The name of the John F. Godfrey Co. has been changed to the Godfrey Conveyor Co., Elkhart, Ind.

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THE IRON AGE

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Business Men in the War

In the recent investigations at Washington, some severe criticisms were made of the connection of business men with the prosecution of the war. Chairman Graham of the House Select Committee on Expenditures has laid particular stress upon a letter which he said Judge Gary wrote, in which it was stated that certain committees at Washington in May, 1917, were operating in flagrant disregard of the Sherman law and other acts of Congress. It now develops that Chairman Graham was in error and that Judge Gary did not write the letter, but merely forwarded to Washington a letter which was written to him by a steel manufacturer. The important point is not as to who was the author of the letter, but as to whether a large majority of the business men who tendered their services to their country at the time of its great need were actuated by patriotic motives. We believe that the history of the war, when finally written, will show that, with possibly a few exceptions, the business men who, at the sacrifice of their time, energy and oftentimes of their health, went to Washington in 1917 and 1918 to work early and late did so from the very highest motives. This is the testimony of such men as Robert S. Brookings, chairman of the Price Fixing Committee of the War Industries Board, and of all other fair minded men who are in a position to know what was being done by the steel manufacturers and other leaders of industry at Washington.

No one will deny that there was great waste in collecting the tremendous stores of material that were necessary to equip our army in France. General Goethals himself has declared that he wasted money in buying supplies. But he and all others who were really awake to the seriousness of the situation did not hesitate to waste money in order to assure the success of the Allied forces. That the situation was desperate when the United States entered the war, and for months afterward, has been clearly established. There was no time to inquire as to who was responsible for the lack of preparation. The immediate duty at hand was to hasten the preparations to the greatest extent possible. There was no time for quibbling, no

time for unwinding red tape. It was time for action.

It was fortunate that the Attorney General was slow to render any legal opinion which might interfere with the most vigorous prosecution of the war. As stated elsewhere in this issue of THE IRON AGE, the Attorney General believed that the question raised in the letter forwarded by Judge Gary was not one of law but one of national policy on which it was not his duty to express his opinion unless so requested by the President. Steel manufacturers were anxious to serve their country, but they were also anxious to observe the law, and nothing shown in the records at Washington or elsewhere can justify a Congressman or any one, for partisan or other reasons, in unfavorably criticizing the men who made it possible to win the war against Germany. The country will not be so ungrateful as to forget that fact or so unappreciative as to fail to acknowledge the debt it owes to those in civilian ranks who served it so willingly and so well.

Steel Wheels for Automobiles

For the past six months few reports on the steel market have been written without some reference to the demands of the automobile industry for steel. That is not due simply to the automobile industry having been active, although no important customers of the steel trade have been as active, unless perhaps an equal place be given to the producers of petroleum. Another reason for this prominence of the automobile industry as a steel consumer is its very rapid growth. It employs enormous tonnages of various descriptions of steel.

Practically all the forms of steel the automobile engineers employ were found ready made for them—sheets, bars, cold-drawn steel, tubes, etc.—and the demands of the automobile engineers were merely for improvements in quality or surface finish. A steel wheel of suitable weight and design would be very desirable for automobiles, but it cannot be well made from sections or forms of steel now available. A new method of production, by rolling or otherwise, would have to be devised. The automobile engineers cannot be expected to demand of the steel trade that it produce an altogether new form of

material by some process which it is given the privilege of inventing. That would be a totally different thing from the automobile engineers demanding that a certain improvement be made in the surface finish of sheets, or that axle or other steel be furnished capable of withstanding more rigid fatigue tests.

The advantage of steel over wood for wheels has been recognized by the adoption in some quarters of the wire wheel, which is surely an artistic monstrosity, if any analogy can be drawn from architecture, for no architect supports a building upon anything of flimsy appearance, no matter what strength formulas or experience prove it to possess; nor is the wire wheel recommended by being easy either to clean or repaint. Its resilience and strength, being of strong material well disposed, are its chief recommendations, except for racing, when its heat radiating power is an advantage.

If a suitable steel wheel were provided and adopted by the automobile trade, the annual tonnage at the present rate of automobile building would be 50,000 to 100,000 tons. The price per pound would scarcely be an object. If the design is to be provided, it must be furnished by the steel industry. The automobile engineers cannot be expected to work out such a problem, for it involves some new method of manipulating or forming the raw steel.

The steel industry has not been averse to developing new products. Twenty years ago it had high hopes for the steel railroad tie. The production of steel ties in 1917 was 9103 gross tons. It thought a great deal of sheet piling, the production of which in rolled form in 1917 represented the interesting total of 18,606 gross tons. Both railroad ties and sheet piling are sold as the commonest description of rolled material, not as a product that could command practically its own price as a steel automobile wheel, 50,000 or 100,000 tons a year, would do.

The Place of the Contract Shop

The war made for the contract machine shop an important place in industry. Years ago works of this character were common enough, but, excepting the small jobbing shops found in every industrial community, they disappeared one after another, save the few which through good management survived to grow to large proportions. The function of such shops has always been to produce anything in metal that the customer might require; the building and development of a machine, or tools, fixtures and the like, or manufactured products. Some of them have manufactured year after year the entire product of customer concerns.

Fortunately, in the period just preceding the war the automobile manufacturers had begun to learn the usefulness of the contract shop for special work requiring high-class mechanical skill to produce, so the industry was not caught wholly unprepared and had a sound basis to build on. But capacity of this sort was wholly inadequate to meet the extreme demand that came almost over night. Particularly were such shops needed to produce tools, jigs, fixtures and other special mechanical appliances; also they were called upon to manufac-

ture instruments and other things used in war. Business poured in on them. They expanded their floor space and equipment, but they could not keep up, for the limit of growth was measured by the available supply of toolmakers and other high class labor. However, the value of what they did in the effort to produce munitions and accessories of war can hardly be overstated.

The result as seen to-day is that their customers have learned that it is often cheaper and more dependable to go to them than to do the work in the home shop. Fully equipped tool rooms on a large scale and tried expert workers can do things with a greater degree of perfection and usually more cheaply than can the ordinary manufacturing plant. The designers of the contract shop are of great service at times in correcting faulty ideas in customers' drawings, even to the point of suggesting radically different and better tools, fixtures or jigs. Such experienced assistance is worth a good deal to customers, especially when they are getting into new fields of effort.

A great change has come over the relations of the contract shop and its customers in the method of payment. The flat contract price is a thing of the past. The charge nowadays is always by the hour, based upon the wage paid the employees engaged in the task, plus percentage for overhead, profit, etc., and in addition there is the charge for material, with something for handling it. The general impression is that this is a much more satisfactory system than the old contract method. Naturally the contract shop is honest in its bills; no shop which is not honest can endure long. Some estimate of probable number of hours required may be given, but it is always an estimate and never a guarantee.

The war literally forced upon many concerns a knowledge of the value of these shops. Previously they had been given little thought by a vast majority of those who could use them to advantage. The necessity begotten of war conditions demanding rush is now replaced by the growing effort to compensate for the high cost of labor and materials by increasing output per human working hour. This can only be accomplished in many cases by the improved tools and appliances which none but high-grade toolmakers can produce to give certain satisfaction.

New Railroad Building

When railroad building began in the United States the wealth of the country was in the neighborhood of \$3,000,000,000, there being no statistics for years prior to 1850, when the wealth was reported at a trifle over \$7,000,000,000. The period of greatest railroad building was in 1886-7-8, with an average annual mileage of nearly 10,000 miles. The wealth of the country was then about \$58,000,000,000. The wealth at present, assuming the increase since 1912, the last year for which there is a report, to have been at the percentage rate that obtained from 1904 to 1912, is fully \$300,000,000,000, this estimate being based of course upon the old value of the dollar. The wealth of the country has been multiplied five-fold since the last great period of railroad building, although the railroad was not

in its infancy at that time. There has probably been as much improvement in railroad building and railroad operation since that time as there was before.

From another angle, it is patent that the desire for facilities of communication has increased at least as rapidly in recent years as it did in earlier years. Year by year men specialize more in their work, and that requires greater interchange of products.

From still another angle, the railroad has been made more adaptable to various classes of work. Not only have steam locomotives become highly specialized for different descriptions of service, but two additional motive powers have been developed, the gas or gas-electric car for light duty on small lines and the hydroelectric road for regions where there is heavy duty and water power is available. These developments should bring railroad track to territory that did not formerly invite it.

It seems fairly obvious, therefore, that the time is altogether ripe for the United States to enter upon a period of railroad building. The work has been delayed by various causes and the movement is now overdue. Over various large areas the country is very far from being fully developed, while there is congestion or overdevelopment in other areas because they chanced to be provided with railroad facilities.

For ten years past it has been asserted by many who should be in position to render reasonably accurate judgment that railroad development in the United States was falling behind the natural requirements of the country's growth. If so, each year that has passed has emphasized the situation, not excluding the years of war.

While the railroad problem is being discussed in and out of Congress—to little purpose thus far in Congress—the discussion runs largely to what treatment should be accorded the railroads with respect to the operation, and possibly the improvement, of their present properties. It seems to be tacitly assumed that it is all one whether a railroad makes an "improvement" by way of adding a second or third track, or by electrifying, or by buying new locomotives, or by adding terminal facilities, on the one hand, or on the other hand by building a branch line. The cases are really altogether dissimilar. In the first case the railroad officials know very precisely what the improvement will do for them. They can estimate accurately the advantage of having a second main line track, or the advantage of a new locomotive over a locomotive they are already operating, or the advantage of improved terminals. As to the prospects of a new branch line, however, they can have no more than tentative guesses. There is a risk involved.

The success of the patrons of a railroad is always vastly greater in the aggregate than the success of the railroad itself. It is essential therefore that some insurance be vouchsafed the railroads for their taking of risks in building extensions, or that new investors be allowed a fair chance. It is no fair chance for a new railroad that it be permitted to make only a very restricted profit at the best, while it may lose as fast and as much as it likes if the worst occurs instead. In the contemplated rail-

road legislation, therefore, there should be reasonable liberality, with a suitable time limit, vouchsafed to investment in new mileage.

Mapping Workers' Homes

In the employment office of the Morgan Construction Co., Worcester, Mass., hangs a map of the city into which are stuck several hundred pins, each with a head of a distinctive bright color. Each represents an employee of the company, its color stands for his nationality, and the location on the map is his place of residence. Charles J. Simeon, head of the company's employment office and its welfare work, prepared the map to serve two purposes. One is in connection with the company's establishment of a dining room for employees. The map shows the distance of their places of residence from the works, and a study of the pins tells how many of the people are able to take their noon meals at home.

The second reason has to do with finding homes for new employees, especially those who are strangers to the city. The Morgan Co., in common with practically every manufacturing plant in the East, has numerous nationalities in its shops. The dozen colors or combinations of colors of the pins do not cover the entire list of races, but they serve the purpose well enough. The newly hired stranger is asked if he requires help in finding a boarding place or a tenement for his family, and if he does the locations of others of his nationality on the map are quickly found, so that if he chooses he can start in his residence where his native tongue is spoken. Perhaps he would be better contented as a consequence.

It is asserted that with most nationalities this procedure does not tend to encourage an un-American herding of races; on the contrary, it is a stimulus to Americanization in that it enables the newcomer to absorb more easily and quickly a knowledge of those things to which he must adapt himself if he is to become a good citizen of his adopted country.

Our Half-Yearly Index

The index of THE IRON AGE for the past half year, January to June inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who may have use for copies can secure them by addressing our Circulation Department.

The newly formed Slick-Knox Steel Co. at Sharon, Pa., expects to begin operations in 90 days. Equipment is already being installed in the buildings owned by the company at Wheatland, Pa., formerly the property of the Blaw-Knox Co. The company, of which L. L. Knox is president, is capitalized at \$6,000,000.

Frey, Brassert & Co., engineers, Chicago, have licensed the Algoma Steel Corporation, Sault Ste. Marie, Ont., to use three Brassert gas washing and drying units on their blast furnaces. This brings the total number of installations up to 72.

"The Iron Age" and Its Readers

Labor problems are to-day exciting a very keen interest among business men, as shown by the letters THE IRON AGE has received in regard to the series of articles by Walter Gordon Merritt published in these columns. A civic and commerce association writes asking for 1000 copies of the articles reprinted in pamphlet form. A superintendent of shops asks for 10 copies in case a reprint is being made. The articles have been reprinted in pamphlet form and copies may be obtained by addressing THE IRON AGE or W. G. Merritt, 135 Broadway, New York.

George S. Hawley, general manager and counsel of the Manufacturers' Association of Bridgeport, Conn., writes to THE IRON AGE as follows:

I have read with a great deal of interest and satisfaction the splendid articles by Walter Gordon Merritt which have been running in THE IRON AGE for the last three weeks.

In these times of intemperate talking and writing on this great question, it is a pleasure to read this clear and unprejudiced presentation of the matter by one who has given it serious study.

I am glad that some one who speaks with authority has finally given to the public a fair statement of what progressive manufacturers are thinking and doing.

I do not quite follow Mr. Merritt in all the suggestions he makes, but I would not mention them here, for I so thoroughly agree with him in the main that I desire only to congratulate him and you for this excellent piece of constructive work.

All the comments received have not been, however, in full agreement with Mr. Merritt. A letter from a reader who has been working with labor problems for many years takes a decidedly pessimistic view of the situation. He says he has so far seen absolutely nothing in the organized labor movement and very little in the shop democracy movement that awakens any enthusiastic hope for our immediate future.

There may be danger sometimes of becoming over enthusiastic. But most of our readers are approaching the subject in a reasonable attitude with a very fair degree of hope that much will be accomplished toward improving the relations of capital and labor.

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Progress in Alabama Iron and Steel Industries

James Bowron, president of the Gulf States Steel Co., Birmingham, Ala., contributes to the Alabama Handbook a 20-page chapter dealing with "The Progress of Iron and Steel Developments in Alabama, 1897-1917." Mr. Bowron's connection with iron and steel production in Alabama antedates that of most, if not all, the men prominent in the industry to-day, and none has been a better student of the history of iron and steel development in the South. The Alabama Handbook deals with Alabama's industrial and agricultural resources and opportunities and is published by the Department of Agriculture and Industries of that State.

Mr. Bowron refers at the outset to the previous estimates of the available iron ore in Alabama, which as given by the U. S. Geological Survey in 1906 were 1,000,000,000 tons of red ore and 75,000,000 tons of brown ore. In 1910, E. F. Burchard of the Survey estimated approximately 797,000,000 tons in the Birmingham district alone, without considering the deposits

of the Attalla and Gadsden district. Mr. Bowron says that the further proving of the ore in Shades Valley by drill holes in the past ten years indicates that the above figures should be enlarged. These drillings have demonstrated the flattening out of the ore and the existence in the valley of the main basin, of which the outcrop worked on Red Mountain along the pitch is merely the up-thrown edge. The ore under Shades Valley shows increased thickness and slightly improved quality over the outcrop in Red Mountain. Mr. Bowron would increase the Burchard estimate by from 250,000,000 to 500,000,000 tons, largely in self-fluxing ore.

Passing to blast furnace, by-product coke oven and steel works practice, the author traces most interestingly the improvement made in the Birmingham district and at other plants in Alabama, in the 20 years. Concerning the use of by-product coke oven gas in steel making it is said: "It is believed that Alabama is entitled to the credit of the first successful use of this gas alone in America; the process of forcing it down upon the bath of metal by the injection of compressed air over the gas having been patented by A. W. Allen. The process was employed at Ensley."

Midvale Pension and Home-Building Plans

Thirty Dollars Per Month at Age of 65
After 25 Years' Service—Ninety Per Cent
Loans to Employees Who Build Homes

The Midvale Steel & Ordnance Co.'s employee pension plan is described in an announcement the company has just made. The plan was established at a meeting of the board of directors held on May 7, 1919. Below is given the complete statement of the conditions under which pensions are paid, together with features of the administration of the plan. What appears to be distinctive is the provision for the payment of a uniform pension of \$30 per month to employees eligible under the requirements, regardless of position or wage or salary previous to retirement. This amount is somewhat more than experience has shown to be the average paid under some industrial pension plans heretofore in operation. Where pensions are graduated according to term of service and wages or salary, the amount drawn by employees who have received ordinary wages has fallen considerably below \$30 per month. Students of industrial pension systems have frequently called attention to the desirability of establishing a basis under which the allowance will come as close as is practicable to providing for the physical wants of the pensioner. The deterring element is naturally the fact that the pension list is very largely made up of persons who have drawn small or moderate pay, and therefore a high minimum pension or a high uniform pension will involve larger annual payments than the average has been under industrial pension systems of which statistics are available. It will be noted from the text below that male employees of the Midvale Steel & Ordnance Co. are eligible to a pension on reaching the age of 65 and women employees on reaching the age of 55, provided in both cases that 25 years of service has been completed:

Administration

The pension plan will be administered by a Pension Committee, appointed by the president of the company. This committee may adopt rules not inconsistent with any of the conditions herein set forth.

The Pension Committee shall decide all questions arising out of the administration of this pension plan, subject to the right of appeal by any employee to the president of the company within thirty days after notice to the employee of the decision of the Pension Committee. The action of the president on such appeals shall be final and conclusive.

Method of Providing Funds

All of the funds required for the payment of pensions will be provided by the company.

Employees Eligible for Pension

Employees of Midvale Steel & Ordnance Co., or of any of its subsidiaries, or of any other company a majority of whose capital stock is owned or controlled by it, or by any of its subsidiaries, may obtain pensions under the following conditions:

In order to inaugurate this pension plan:
On July 1, 1919:

All employees who on that date have been twenty-five years or longer in the service, and have reached the age of 70 years or over, will be retired and pensioned. All employees who on that date are sixty-five years of age or over, and who have completed 25 years of service, will be eligible to receive pensions.

After July 1, 1919:

All employees will be retired and pensioned upon reaching the age of seventy years, provided they have previously completed 25 years of service.

All male employees will be eligible for pensions when they reach the age of sixty-five years, provided they have previously completed 25 years of service.

All employees who, after attaining the age of sixty-five years and before attaining the age of seventy years, complete 25 years of service, will be eligible for pensions upon completing 25 years of service, and may be retired

and pensioned either at their request, or at the request of the employing officer.

All women employees who have completed 25 years of service will be eligible for pensions when they reach the age of fifty-five years.

Definition of Service for Period Prior to July 1, 1919

Time lost prior to July 1, 1919, by reason of leave of absence or suspension not exceeding six months, or temporary lay-off on account of reduction in force, or disability not exceeding two years, shall not be deducted in reckoning the length of service.

Dismissal, voluntary withdrawal from the service, or cessation of service by reason of absence in excess of the above prescribed limitations, followed by reinstatement in the service within two years, shall not be considered as breaks in the continuity of service, but the time thus lost shall be deducted in reckoning the length of service.

Definition of Service for Period Beginning July 1, 1919

No credit in reckoning the length of service will be given for time lost from and after July 1, 1919, through leave of absence, suspension, disability, or through lay-off in other than seasonal occupations.

Employees will lose all credit for previous service if they remain absent from the service longer than six months on account of leave of absence or suspension, or longer than two years on account of lay-off due to reduction in force, or disability; provided, however, that employees injured while on duty may retain credit for previous service until termination of the period for which statutory compensation is payable, if such employees then immediately return to work.

Employees who voluntarily quit the service will lose credit for all previous service.

Employees who are discharged from the service will lose credit for all previous service, unless re-employed within six months.

The Pension Committee in each case shall fix the date upon which the pension shall begin. The pension shall terminate with the payment for the month succeeding that in which the death of the pensioner occurs.

Employees in military or naval service or other Government service in time of public emergency will receive special consideration in determining length of service.

Amount of Pension

A uniform pension of \$30 per month will be paid to each employee eligible under the foregoing requirements, regardless of position or wages or salary prior to retirement. Payments will be made monthly.

Pension for Permanent Total Incapacity

Any employee who becomes permanently and totally incapacitated as a result of disease or injuries for which compensation is not being paid or provided under workmen's compensation laws, and who has then been fifteen years or longer continuously in the service, shall be eligible for a pension. Where payments have been made under workmen's compensation laws, the employee shall be eligible for pension when such payments cease.

Method of Applying for Pension

Any employee fulfilling the requirements set forth herein may make application for a pension to the general superintendent of the works where he is employed, or the general superintendent may recommend a pension for him.

Blank application forms may be obtained at the general office of the works.

The facts set forth in the application blank will be investigated by the general superintendent, and the application will be forwarded by him to the secretary of the pension committee, with his recommendation.

General Regulations

No assignment of pensions will be permitted or recognized by the company under any circumstances; neither shall pensions be subject to attachment or other legal process for debts of the beneficiaries.

Part time employees, i. e., those rendering intermittent service or retained in a consulting capacity, but not governed by regular hours, will not be eligible for pensions.

The establishment of this pension plan shall not limit, in any manner, the right of the companies, through their officers, to discharge any employee.

This pension plan is purely a voluntary provision on the part of the company, for the benefit of employees after long and faithful service, and does not constitute any contract, or confer any vested or legal right upon any employee.

This pension plan may be changed by the board of directors of Midvale Steel & Ordnance Co. at its discretion.

Home Building Plan for Employees

At a meeting of the elected representatives of employees and officers of the Midvale Steel & Ordnance Co. held in Philadelphia, May 10, 1919, the employees' representatives asked that the company extend its activities in the direction of improving conditions in the various communities in which its works are located by acquiring property and building homes for employees. At a meeting of the board of directors held June 4 a fund of \$2,500,000 was voted for the carrying out of a home-building plan. A committee consisting of A. C. Dinkey, A. A. Corey, Jr., D. Brewer Gehly, J. M. Milliken and H. M. O'Brien will formulate a plan for home-building and to administer it.

All applications for loans to employees for home-building must be in writing on printed forms. Appraisals of property values are to be made by an agent or agents of the committee and all building plans and contracts for construction of buildings must be approved by the committee or its agents. The employee is required to provide at least 10 per cent of the total value of the building property; the remaining 90 per cent will be loaned by the company at 5 per cent. No loan will be in excess of \$8,000. Payments are to be made in monthly installments to be deducted from wages. The maximum term of the loan is 12 years. The purchaser has the right at any time to pay off any part or all of the loan. Taxes are paid by the company and charged against the loan account of the purchaser, and the same provision is made as to insurance. Monthly payments include interest, and interest is charged against the net balance due at the beginning of each month. The remaining provisions of the plan are given verbatim below:

In the event of the permanent incapacity of purchaser through illness or accident while an employee of the com-

pany, or of any of its subsidiaries, or of his death while so employed, he or his legal representatives may continue the payments under the contract; or, if they so elect, may cease the payment of installments, in which event the total of the principal sum which has been paid on account of the loan shall be returned to the purchaser or his legal representatives; but all interest paid shall be retained in lieu of rental for the use of the property. Proper adjustments will be made with respect to amounts paid for taxes and insurance.

In case the purchaser ceases to be an employee of the company, or of any of its subsidiaries, he may, within 60 days complete the payment of all deferred installments, interest and charges of whatsoever kind due, thus securing a clear title to the property. Otherwise the company will return to the purchaser the principal sum of money paid by him on account of the loan, but all interest shall be retained in lieu of rental for the use of the property. Proper adjustment will be made with respect to amounts paid for taxes and insurance.

Title to all property purchased by employees under this plan will be taken in the name of the company or in one of its subsidiaries, and a contract of sale will be entered into with the purchaser providing for the delivery of a deed to the property at the completion of the payment of all installments, interest, or other charges thereon.

In addition to assisting employees to acquire their own homes, one of the objects of this plan is to increase the number of houses in the communities in which the several works of the company are located. Employees who expect to secure loans are therefore urged to plan to build rather than to buy existing houses.

The widest latitude in keeping with sound judgment will be allowed employees in selecting the locations of their homes. However, no loans will be made for the purchase or building of homes in localities which in the judgment of the committee do not afford a healthy social and physical environment.

While the company owns or controls building lots at Coatesville and Johnstown, Pa., which are desirable for building purposes, and which will be sold at reasonable prices, it is not the intention of the company to restrict employees to these properties in making their selection of a location for their homes.

The company is willing to loan 90 per cent of the total value of the completed home. However, the Home Building Committee recommends that the purchaser make the maximum payment within his means, in order to come more quickly into full ownership, with the least possible expenditure for interest.

Industrial Conference in Late August

An industrial conference is to be held on Friday, Saturday, Sunday and Monday, beginning Aug. 29, at Silver Bay, Lake George, N. Y. It is to be held under the auspices of the International Committee of Young Men's Christian Association similar to a conference held last year. The general theme is "Human Relations and Betterment in Industry."

In the tentative program a list of speakers is announced. Some of these are down for definite topics and others have been invited to discuss them. Among others may be mentioned the following: Frank Morrison, secretary American Federation of Labor; C. J. Hicks, assistant to the president Standard Oil Co.; John J. Eagan, chairman board of directors American Cast Iron Pipe Co.; W. H. Woodlin, president American Car & Foundry Co.; J. Parke Channing, vice-president Miami Copper Co.; Prof. J. W. Roe, Yale University; F. J. Kingsbury, president Bridgeport Brass Co.; E. B. Saunders, assistant to the president Simonds Mfg. Co.; H. C. Wolf, superintendent Rome Brass Co.; George F. Hinkins, superintendent blacksmith and reservoir departments, Westinghouse Air Brake Co.; Leonard S. Tyler, vice-president Acme Wire Co.; George E. Comstock, Chase Companies; F. M. Potter, vice-president Rome Wire Co.; Clarence H. Howard, president Commonwealth Steel Co.; George E. Emmons, vice-president General Electric Co., and John Goss, secretary Scovill Mfg. Co.

Chicago Meeting of Mining Engineers

From a technical point of view, the Chicago meeting of the American Institute of Mining and Metallurgical Engineers, Sept. 22 to 26, promises to be one of the most interesting in its history. The number of technical papers offered is greater than has been offered for any previous meeting; upward of 150 have

been submitted to the committee, which finds it no small task to arrange a program to present this number with a minimum of conflicts.

Screw Thread Commission on Way to Europe

The National Screw Thread Commission sailed for Brest from Hoboken, N. J., on the Leviathan, July 13. The delegation consisted of Dr. S. W. Stratton, chairman; Lieut.-Col. E. C. Peck, vice-chairman, representative of the U. S. Army; Capt. John O. Johnson, representative of the U. S. Army. Commander L. B. McBride, representative of the U. S. Navy, at present attached to the American Embassy, London; F. O. Wells, representative of the American Society of Mechanical Engineers; Luther D. Burlingame, representative of the A. S. M. E., alternate for James Hartness; H. L. Horning, representative of the Society of Automotive Engineers, alternate for E. H. Ehrman; Capt. Earle Buckingham, representative of the S. A. E., alternate for H. T. Herr, and H. W. Bearce and Lieut. Robert Lacy, technical secretaries.

The party will meet French engineers in Paris and then proceed to London, where arrangements have been made for an informal conference with the British Engineering Standards Association. It is expected that a tentative agreement will be reached with the British on pipe thread standards.

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, has placed a contract with the Fuller Engineering Co., Allentown, Pa., for an installation of Fuller coal pulverizers in connection with its boiler plant.

The Unity Mfg. Co., manufacturer of tools and dies, has removed its place of business from 1632 North Halsted Street, Chicago, to 224-232 North Halsted Street.

Iron and Steel Markets

MORE FAVORABLE FACTORS

New Orders and Operations Increase

Trade Trickling from Embargoed Countries— Chicago Basing Question

All the week's iron and steel trade developments are favorable, with indications of sustained if not cumulative activity throughout the summer. In the Pittsburgh district operations are on a larger scale, the Carnegie Steel Co. having 75 to 80 per cent of ingot capacity active, while a large independent interest there is above 80 per cent.

Blast furnace resumption fully bear out the indications at the opening of the month. A half dozen stacks are about to go in, including one each in the Philadelphia, Youngstown and Pittsburgh districts and a new furnace in West Virginia. The increase in bookings by rolling mills is calling for more pig iron, and stocks have been going down steadily for more than a month.

The fact that new orders for rolled steel have exceeded shipments in the past three weeks at a number of Central Western plants has led to more selective policy by sellers, and both in export and domestic business bidding in some lines is more restricted. Wire products, sheets, tin plates, bars and pipe still lead in activity. In sheets and tin plates some sellers have booked in the first half of July nearly double the orders taken in the full month of June. It is estimated that this year's tin plate production will amount to 70 per cent of last year's output.

Railroad buying is still delayed and a number of plate mills are waiting for business, but if railroads and shipyards add their requirements later in the year the situation in heavier products may develop interesting possibilities. Labor supply and coke supply may then prove to be pivotal factors.

The Washington hearing on the proposal to establish Chicago district basing prices indicated that the Federal Trade Commission investigation will be far reaching and may require months. The outcome may be f. o. b. mill quotations which will affect the competitive situation in all steel-consuming industries east of the Mississippi.

The Central West holds out the best promise in structural steel. Bids were taken on 3600 tons for the Hanna Building at Cleveland, and inquiries include 3800 tons for the American Rolling Mill Co., Middletown, Ohio, and 2000 tons for the Detroit Edison Co., Detroit. A library building at Chicago calls for 2500 tons and a bridge at Jacksonville, Fla., for 2700 tons. Pittsburgh reports close to 6000 tons placed, including 2500 tons of bridge work for the South Manchurian Railway. In the East four lettings amounted to 5000 tons and a new insurance building in New York will take 2700 tons.

While not expected to be a factor in steel mill operations for some time, the bids taken by the French High Commission for a large number of ships, to be built in American yards are now on their way to France. If the program calling for

200 ships is carried out, several hundred thousand tons of steel would be required.

The country's steel ingot output in June, based on nearly complete returns, is put at 2,640,984 gross tons, or 105,639 tons a day for 25 days, as compared with 85,024 tons a day in May. This gain of 24 per cent, far more marked than that in pig iron, accentuates other evidences of the important turn for the better last month.

Of special significance are the first tricklings of trade with embargoed countries of Europe. At Philadelphia 714 tons of manganese ore from the Caucasus, the first in nearly five years, was unloaded last week. Then there is an inquiry from a German-Austrian source for American spiegeleisen. However, the prospect of any dealings in steel products between Germany and the United States is very remote.

British steel output is checked by strikes and reduced hours, and with an advance of 6s. per ton in coal steel prices are likely to go upward \$4 or more per ton, in the meantime makers generally refusing to quote.

A broadening inquiry from all parts of the globe marks the export market. Buyers are slow to accept the belief here in the stability of prices, but the volume of contracting is sufficiently large to indicate there is no summer-time dullness in foreign trade. Tin plate is now reckoned in export activity. A Pittsburgh mill has booked fully 20,000 boxes for Japan and much more is under negotiation.

In pig iron leading producers in Birmingham, who are sold up through the third quarter, have turned down offers which recently would have been seized. In Philadelphia low-priced iron is fast disappearing, and price advances are announced despite a slow demand. Higher prices are looked for.

Pittsburgh

PITTSBURGH, July 15.

The record made up to July 15 by the steel mills in orders received and passed to the mills for rolling, also in specifications against contracts, is much heavier than expected. Two of the larger steel mills report that actual business booked up to July 15 is larger than in the entire month of June, and in sheets, tinplate and wire products, business in the first half of July is nearly double what it was all last month. Operations among the steel mills are steadily getting larger, and the Carnegie Steel Co. is operating to between 75 and 80 per cent of ingot capacity. Another large steel interest reports it is running close to 85 per cent of ingot capacity and will start another blast furnace within a few days to meet its growing needs for pig iron. There are no signs anywhere of a let up in the volume of the new business in iron and steel, but on the contrary it is growing steadily larger. The tin plate mills are not able, even with operations of 90 per cent, to meet the demand for tin plate as promptly as it is wanted, some of the larger can makers having used up all of their stocks, and now want tin plate urgently. Some can makers are operating their plants with their night shifts, which is very unusual in this trade, and is being done to meet the heavy demand for cans. There is no longer any idea on the part of consumers of trying to get lower prices, but their effort now is to get their or-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 15, 1919	July 8, 1919	June 17, 1919	July 16, 1918
No. 2 X, Philadelphia...	\$29.10	\$28.60	\$29.50	\$34.40
No. 2, Valley furnace...	26.75	26.75	26.75	33.00
No. 2 Southern, Cincin.†...	28.35	28.35	28.35	36.60
No. 2, Birmingham, Ala.†...	24.75	24.75	24.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, deliv., eastern Pa.	26.00	26.00	25.50	32.90
Basic, Valley furnace...	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh...	29.35	29.35	29.35	36.60
Malleable Bess., Ch'go*	27.25	27.25	27.25	33.50
Malleable Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh...	27.25	27.15	27.15	33.40
L. S. charcoal, Chicago...	38.85	38.85	38.85	37.85

Rails, Billets, etc., Per Gross Ton:	July 15, 1919	July 8, 1919	June 17, 1919	July 16, 1918
Bess. rails, heavy, at mill.	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill.	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh...	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh...	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh.	42.00	42.00	42.00	51.00
Forging billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila.	42.50	42.50	42.50	51.30
Wire rods, Pittsburgh...	52.00	52.00	52.00	57.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.595	2.595	2.595	3.73
Iron bars, Pittsburgh...	2.75	2.75	2.35	3.50
Iron bars, Chicago...	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh...	2.35	2.35	2.35	2.90
Steel bars, New York...	2.62	2.62	2.62	3.145
Tank plates, Pittsburgh...	2.65	2.65	2.65	3.25
Tank plates, New York...	2.92	2.92	2.92	3.495
Beams, etc., Pittsburgh...	2.45	2.45	2.45	3.00
Beams, etc., New York...	2.72	2.72	2.72	3.245
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh...	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago District is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 15, 1919	July 8, 1919	June 17, 1919	July 16, 1918
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh...	3.20	3.25	3.25	3.50
Cut nails, Pittsburgh...	4.25	4.25	4.25	4.00
Fence wire, base, P'gh.	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh.	4.10	4.10	4.10	4.35

Old Material, Per Gross Ton:	July 15, 1919	July 8, 1919	June 17, 1919	July 16, 1918
Carwheels, Chicago	23.25	22.50	22.50	29.00
Carwheels, Philadelphia	23.00	23.00	23.00	29.00
Heavy steel scrap, P'gh.	19.50	19.00	17.50	29.00
Heavy steel scrap, Phila.	19.00	19.00	16.00	29.00
Heavy steel scrap, Ch'go.	19.50	18.00	17.00	29.00
No. 1 cast, Pittsburgh...	19.00	19.00	19.00	29.00
No. 1 cast, Philadelphia...	22.00	23.00	22.00	29.00
No. 1 cast, Ch'go, net ton.	22.00	22.00	21.00	29.00
No. 1 RR. wrot, Phila.	25.00	24.00	21.00	34.00
No. 1 RR. wrot, Ch'go.	17.00	17.00	17.00	29.75

Coke, Connellsville, Per Net Ton at Oven:	July 15, 1919	July 8, 1919	June 17, 1919	July 16, 1918
Furnace coke, prompt...	\$4.00	\$4.25	\$4.00	\$6.00
Furnace coke, future	4.12	4.12	4.00	6.00
Foundry coke, prompt...	5.00	5.00	4.50	7.00
Foundry coke, future	5.00	5.00	5.00	7.00

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	22.00	20.00	18.25	26.00
Electrolytic copper, N. Y.	21.75	19.75	18.00	26.00
Spelter, St. Louis	7.45	7.15	6.50	8.50
Spelter, New York	8.00	7.50	6.85	8.75
Lead, St. Louis	5.25	5.15	5.10	7.75
Lead, New York	5.50	5.40	5.35	8.05
Antimony, Asiatic, N. Y.	8.37 1/2	8.37 1/2	8.37 1/2	13.00
Tin plate, 100-lb. box, P'gh.	\$7.00	\$7.00	\$7.00	\$7.75

ders on the books of the mills and to be assured of a supply of material when needed.

Prices all along the line are firm, and the market on wire products and pipe is likely to have a general advance in the near future. One large mill has already advanced butt-weld pipe \$5 and lap-weld pipe \$10 a ton, but up to this time is alone in this action. The present volume of business in sheets and tin plate is the heaviest known in a long time, and mills are getting rapidly filled for the remainder of the year. In lap-weld pipe and oil country goods, three or four of the larger makers have about all the business on their books they can handle this year. All signs now point to an active steel market over the next two or three months.

Pig Iron.—The local market is fairly active in malleable and foundry iron, but standard Bessemer and basic are quiet. The Fort Pitt Malleable Iron Co. is credited with having bought several large blocks of malleable iron for first half of 1920 delivery at full price of \$27.25 Valley furnace. We also note sales of 5000 to 6000 tons of No. 2 foundry for delivery over the last half of 1919 at the regular price of \$26.75 at Valley furnace. Owing to the greater activity in pig iron, more furnaces are blowing in. Mattie of A. M. Byers & Co., at Girard, Ohio, is to go in this week, the Jones & Laughlin Steel Co. will start another Eliza stack in a few days and the new Weirton Steel Co. furnace will start next week. One maker is asking \$2 a ton advance on foundry and mill iron for last quarter of the year delivery, and predictions are freely made that pig iron prices will be higher later in the year than they are now. Regular prices are firm, furnaces refusing to do any shading. We quote:

Basic pig iron, \$25.75; Bessemer, \$27.95; gray forge, \$25.75; No. 2 foundry, \$26.75; No. 3 foundry, \$26.25, and Malleable, \$27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Billets and Sheet Bars.—The sheet and tin plate mills are using nearly double the quantity of sheet bars they were using two months ago, and the demand is

getting heavier. The Carnegie Steel Co., in order to meet the increased demand of its customers for sheet bars, will soon start up its Columbus, Ohio, steel works on sheet bars, which has been idle since last year. The Carnegie Steel Co. is also rolling some sheet bars at its Edgar Thomson Works at Bessemer, which it has not done for a long time. This company is now operating at better than 75 per cent of its ingot capacity, and other steel companies are doing equally well. Prices on billets and sheet bars are very firm, and the demand for forging billets is more active than for a long time.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$38.50, 2 x 2 in. billets at \$42; sheet bars, \$42; slabs, \$41, and forging billets, \$51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Consumers seem pretty well covered for the remainder of this year, and the demand for ferroalloys is light. Domestic 78 to 82 per cent ferromanganese is freely offered at \$115 delivered, while the price of English is \$115 c i f Atlantic port, so that the chances for sales of the English product are not very good. Owing to labor troubles, two of the furnaces in Jackson County, Ohio, that make the lower grades of ferrosilicon, are idle, while the blast furnace of the other producer has been down for some time, because of large stock of material on hand.

We quote 78 to 82 per cent resale ferromanganese at \$115 to \$120 delivered, with a reduction of about \$2 per unit for lower percentages. We quote domestic ferrosilicon at \$30 and 18 to 22 per cent spiegeleisen at \$33 to \$35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, \$47.75; 10 per cent, \$49.75; 11 per cent, \$53.05; 12 per cent, \$56.35. We quote 6 per cent silvery iron, \$36.75; 7 per cent, \$38.50; 8 per cent, \$40.25; 9 per cent, \$42.25, and 10 per cent, \$44.75. About \$3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—On universal plates, two local mills report they are comfortably filled over third quarter, but have some rolling space for sheared plates, for which the demand is only fair. The Government opened bids on Monday at Washington on about 5000 tons of plates and

shapes for a fuel boat, but it is not known at this writing whether the award was made or not. The export demand for plates is fairly heavy, Japan and China being the leading buyers. No orders for steel cars are in sight, and plates have not shown as much improvement in demand as other lines of steel. Prices are fairly firm, but are occasionally shaded about \$2 a ton by a few of the smaller mills. The regular price on $\frac{1}{4}$ in. and heavier tank plate, adopted on March 21 last, is 2.65c. at mill, Pittsburgh, and the larger makers say they are holding this price.

Structural Material.—The inquiry in the past week has been fairly active. The Jones & Laughlin Steel Co. has taken about 500 tons for steel barges for the Dravo Contracting Co., the American Bridge Co. has taken 1300 tons for factory buildings for the B. F. Goodrich Co., Akron, Ohio, and about 500 tons of bridge work in West Virginia. The McClintic Marshall Co. has taken 2500 tons of bridge work for the South Manchurian Railway, 250 tons for steel buildings for the Wyckoff Steel Co., Economy, Pa.; the Pittsburgh-Des Moines Steel Co. has taken 300 tons for Government wireless towers at San Francisco.

Sheets.—The buying and specifications against contracts for sheets are growing heavier. Last week the American Sheet & Tin Plate Co. had the second largest week in its history in hot sheet and tin mill products. The independent mills also report very heavy business in all grades of sheets and are operating to between 80 and 85 per cent of capacity, the American Sheet & Tin Plate Co. running this week to 88 per cent. The export demand, especially for galvanized sheets, is also very active and heavy shipments are being made to the Orient, Australia, India, South America, and other countries. Recently a local interest made a large shipment of galvanized sheets to Holland, this being the first order received from that country for a very long time. Some mills that specialize in automobile sheets are sold up for third quarter, and have a good many orders booked for fourth quarter. The general outlook for the sheet trade for the remainder of this year is very promising. Prices are firm, and practically all cutting has disappeared, as the few mills that were shading the market are now said to be sold up. Prices effective from March 21, which the mills report are holding firm, are given on page 201.

Tin Plate.—Several of the larger mills report that specifications and orders received up to July 15 are heavier than in the entire month of June. Operations of the tinplate mills are increasing fast, the American Sheet & Tin Plate Co. running this week to 96 per cent, and the independent mills at about the same rate. Estimates are that the fruit and vegetable crops in California this year will be from 25 to 50 per cent larger than in any year in the history of that state, and very heavy orders for shipments of tinplate to California have been placed with local mills, which are shipping them out as fast as possible. The salmon pack this year will be heavier than expected, and orders from this source are also very active. It is evident that many packers underestimated their needs for tinplate this year and they are now placing orders very freely, with requests for prompt delivery, showing that the plate is being cut up into cans as fast as received. Export demand is also heavier, coming from the Orient, South America and other places. A local mill booked recently 20,000 boxes for Japan. Estimates for tin plate output this year, because of the recent activity, are higher and it is expected to run possibly 70 per cent of the output of last year, which in round figures was 32,000,000 boxes. Prices are firm, and on export business, prices obtained are very close to the domestic market. We quote production tin plate for the remainder of the year at \$7 per base box f.o.b. Pittsburgh, while stock items are running about \$6.50 per base box. We note a sale of about 3000 boxes at this price. The demand for terne plate is heavy, and mills are sold up for two or three months. Prices on terne plate, effective from March 21 are given on page 201.

Iron and Steel Bars.—One large maker of steel bars reports it is fully sold up for third quarter, and has instructed its sales agents not to take any more orders for that delivery. Large implement makers have covered heavily for the remainder of the year, and are sending specifications to the mills very actively. The increase of building operations has caused a large demand for reinforcing bars, which are active. One inquiry in the market is for 1200 tons for a building for the Goodrich Tire Co., Akron, Ohio. The demand for iron bars is also more active, and mills are running at 75 per cent of capacity. Mills report that prices on bars are very firm.

We quote steel bars, rolled from billets, at 2.35c., and from old steel rails, 2.45c. Eastern mills are quoting iron bars for eastern shipment at 2.35c., while for western shipment 2.55c. Pittsburgh, is quoted. Pittsburgh mills rolling iron bars quote at 2.75c., Pittsburgh, plus full freight rate to point of delivery.

Wire Rods.—The demand is heavier, reflecting the active conditions ruling in wire products. A local mill rolling wire rods reports it is short of men in its wire drawing department, and has no trouble in disposing of its surplus rods at full regular prices. We note a sale of 500 tons and one of 800 tons of soft rods at the regular price of \$52, at mill. Demand for high carbon rods is also active, sales being made at \$65 and higher. Prices on rods, as adopted on March 21, are given on page 201.

Wire Products.—Two local mills report that up to July 15, orders and specifications received for wire and wire nails are nearly double for the same period in June. One concern is sold up for third quarter and is scanning orders for fourth quarter very closely. All the independent wire mills are agreed that there should be an advance in the market of \$2 to \$5 per ton, and this matter now seems to be up to the leading interest as to whether it will agree to make an advance. It is said that wire nails at \$3.25 per keg do not afford any profit. Export demand for wire and wire nails is heavy, and shipments are being made to foreign countries freely. One local company is filled so far ahead on domestic business that it has stopped quoting on export inquiries. Jobbers are trying to cover as far ahead as they can, in view of the possible advance in prices, and also because they are having a heavy demand from customers. Several mills state they are back six weeks in delivery on wire. Prices are firm, and it is said there is no longer any cutting on coated nails. Prices as adopted on March 21 are given on page 201.

Cotton Ties.—Very few new orders are being placed, as consumers covered when the season opened. July price on cotton ties is \$1.71½ per bundle of 45 lb. f.o.b. mill, Pittsburgh.

Hoops and Bands.—Two local mills report a better demand for both hoops and bands, which is now stated to be about 50 per cent of capacity. It is claimed prices are holding firm. We quote steel hoops and bands at 3.05c, Pittsburgh, plus usual extras.

Hot-Rolled Strip Steel.—Consumers and jobbers do not now expect any lower prices, and are placing orders more freely, desiring to cover ahead over the remainder of this year as far as they can. We quote hot-rolled strips at 3.05c to 3.30c per lb. f.o.b., Pittsburgh, the higher price being for hot-rolled strips for drawing and deep stamping uses.

Cold-Rolled Strip Steel.—The new demand is heavier than for some time and mills are now operating at about 60 per cent of capacity.

We quote cold-rolled strip steel at \$5.65 base per 100 lb. f.o.b. Pittsburgh, for 1½ in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Box charge 25c. per 100 lb.

Shafting and Screw Stock.—The demand is getting heavier, and jobbers and consumers are trying to cover as far ahead as they can. Mills are not being importuned now to shade prices, but rather to take care of customers' needs. Some large contracts for shafting

have lately been closed by implement makers for delivery over the remainder of this year, and it is said that on all of this large business, the regular discount of 28 per cent in car loads was observed. Automobile builders are buying heavily, and shafting makers are operating their plants now to larger capacity than for some months. Discounts as adopted March 21, which are reported firm, are 28 per cent off in car loads and 23 per cent in less than car loads.

Nuts and Bolts.—Due to the heavy demand and high prices of steel and labor, some makers of nuts and bolts have advanced prices 5 to 10 per cent, but this is not general as yet. However, it is likely that after the meeting of the nut and bolt makers, to be held in New York on July 16, there will be a general advance in prices. Jobbers and consumers are buying freely, trying to cover ahead as fast as they can, in view of the expected higher market. Two months ago, several makers of nuts and bolts were running at only 30 to 40 per cent, but now report they are operating close to 100 per cent of capacity. Discounts now in effect, with some sellers, but which are likely to be advanced this week, are given on page 201.

Rivets.—The question of an advance in price of rivets will be discussed at a meeting of the rivet makers in New York on July 16. The demand is better, and operations are now on about a 60 per cent basis. We quote buttonhead structural rivets at \$3.70, and cone-head boiler rivets at \$3.80 per 100 lb. f.o.b., Pittsburgh.

Spikes.—The demand for mine spikes is reported heavy, but for railroad spikes, it is light, being only for small lots to cover repair work by the railroads. The demand for jobbers is fairly active.

We quote standard spikes, 9/16 x 4 1/4 in., and also small spikes, \$3.35 base per 100 lb. in carload lots of 200 kegs or more, plus usual extras. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more.

Skelp.—The few mills that roll skelp report they have their output practically sold up for the remainder of this year, and prices are very firm. We quote sheared steel skelp at 2.65c.; universal, 2.55c., and grooved, 2.45c. per lb., f.o.b., Pittsburgh.

Iron and Steel Pipe.—The demand for lap-weld pipe and oil country goods is much the heaviest ever known in the history of the pipe trade. Mills are turning down more business than they are entering, having about all the obligations on their books they care to have for the third quarter, and not being anxious to sell very much for fourth quarter, in view of the expected higher prices. The Wheeling Steel & Iron Co. has advanced prices on butt-weld pipe two and one-half points, or \$5, and on lap-weld, five points, or \$10 per ton, effective from July 10. So far, this is the only company that has advanced prices, but it is said all the independent mills are considering the matter of making an advance, and may do so in the near future. The attitude of the leading pipe interest is not favorable to an advance in prices at this time, largely on account of the effect it might have on labor. The Gulf Pipe Line placed last week 100 miles of 3-, 4- and 6-in. pipe, divided among three mills. An inquiry in the market for quick shipment is for 70 miles of 8-in. pipe, and this business has been offered to at least two mills that have turned it down, saying they cannot possibly make the delivery wanted. The Jones & Laughlin Steel Co. is now turning out 15 1/2-in. casing at its Alliquippa, Pa. works. None of the mills has much tonnage to spare for third quarter, and two or three of the larger makers are practically filled for the remainder of this year. Discounts on iron and steel pipe now in effect, but which may be advanced at an early date, are given on page 201.

Boiler Tubes.—Mills report the demand for boiler tubes as slightly better, but merchant tubes remain very quiet. Prices are still being shaded more or less. Discounts on iron and steel tubes, which sometimes are shaded, are given on page 201.

Coke.—The expected shortage in supply of coke, due to the July 4 holiday, did not materialize, and as

a result the supply of prompt furnace coke is larger and prices are easier. We note a sale of 50 cars of high grade furnace coke for prompt shipment at \$4.10 per net ton at oven. Consumers of both furnace and foundry coke are now pretty well covered over the remainder of the year and no contracts have been made recently. We quote standard grades of 48-hr. furnace coke for prompt coke at \$4 to \$4.10, and standard grades of 72-hr. foundry coke for prompt shipment, or on contracts, at \$5 to \$5.25, all in net tons at oven. Output of coke in the upper and lower Collinsville region for the week ending July 5 was 130,790 tons, a decrease from the previous week due to the July 4 holiday of only 7843 net tons.

Old Material.—The amount of scrap moving from dealers to consumers in the past week was very small, but the market is firm, and dealers are predicting higher prices. Consumers seem satisfied to test the market and are holding off buying. Stocks of scrap in dealers' yards are reported heavy, but there is no pressure to sell. About the only scrap moving is heavy melting steel, borings and turnings, for which the demand is fairly active. We have advanced prices on these grades and now quote as follows:

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$19.50 to \$20.00
No. 1 cast, for steel plants	19.00 to 19.50
Re-rolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	19.00 to 20.00
Compressed steel	14.50 to 15.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	13.50 to 14.00
Bundled sheet stamping	12.00 to 12.50
No. 1 busheling	14.50 to 15.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) 1/4 in. and heavier	23.00 to 24.00
Iron car axles	29.00 to 30.00
Locomotive axles, steel	29.00 to 30.00
Steel car axles	26.00 to 27.00
Railroad malleable	16.00 to 16.50
Machine shop turnings	12.00 to 12.50
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	19.00 to 20.00
Sheet bar crop ends (at origin)	19.00 to 19.50
Heavy steel axle turnings	13.50 to 14.00
Heavy breakable casts	19.50 to 20.00
Cast iron borings	13.00 to 13.50
No. 1 railroad wrought	19.50 to 20.00

Christopher Hannevig, president Pusey & Jones, with shipbuilding plants at Gloucester City, N. J., and Wilmington, Del., is considering the organization of a new company, to be known as the Pennsylvania Ship Repair Plant, with capital of about \$3,000,000, to build three new drydocks adjoining the shipyards at Gloucester City, with shops and construction buildings to form a complete repair works for vessels of all kinds. The proposed drydocks will be of 10,000, 6,000 and 3,000 tons capacity, respectively. The new works will be operated in conjunction with the local shipyard. The plant has 11 shipways and it is planned to utilize four of these ways in the future for normal operations, as soon as the Emergency Fleet Corporation relinquishes the plant. The yard will specialize in the construction of steel cargo carriers, with capacity of 13,000 tons upwards.

The Hyde Park Foundry & Machine Co., Hyde Park, Pa., builder of chilled and sand rolls, rolling mill steel works and tin plate machinery castings and ingot molds, has received a contract from the Eastern Rolling Mill Co., Baltimore, for equipment for its new mills as follows: Twenty 26x56-in. stand of cold mills complete, seven 156-in. squaring shears, four 48-in. squaring shears, four 44-in. doubling shears, two 44-in. roll lathes, eight 54-in. steam doublers, also a contract from the Newton Steel Co., recently organized, to build a sheet mill plant at Newton Falls, Ohio, for new equipment as follows: Thirteen stands of hot mills complete, eight stands of cold mills complete, three 126-in. and one 156-in. squaring shears, four 48-in. steam doublers.

Philadelphia

PHILADELPHIA, July 15.

Opinion that the market in general shows a little improvement is practically unanimous, but that operations and sales are in many cases far below normal cannot be disguised. Steel bars, tubular goods and wire products are really active. Plates and structural material are in very light demand, plate mills operating at from 25 to 40 per cent. The structural situation is notable principally because of rather indefinite promises. Yet, one leading mill, assisted by export orders, says it has had one of the best weeks since the declaration of the armistice; that it is not undertaking deliveries of bars inside of 5 to 7 weeks, while in wire it requires 60 days. It is a mill that makes a wide diversity of products. Some of the bar-iron mills have advanced their quotation to 2.50c., Pittsburgh, of 2.75c., Philadelphia.

Encouraging to the pig-iron trade is the almost complete elimination of extremely low-priced iron, some of the recent sellers of which have booked all the business they want at the low levels and have either withdrawn from the market or advanced their quotations. The unusually wide range in quotations as made by different makers is still much in evidence. The market is quiet as compared with a few weeks ago, but there is something done every day, especially in foundry, basic and low phosphorus being very dull.

While there is less tendency to grant concessions in plate prices, it is said by persons interested on the manufacturing side that less than 2.65c., Pittsburgh, can be done in all probability. Structural shapes appear to be firmly held.

Domestic makers of standard ferromanganese are now quoting \$115, delivered, instead of \$125, and therefore are better than meeting the quotation of \$115, seaboard, for British material. The Customs House reports the arrival here last week of 714 tons of manganese ore from Russia in Asia which suggests the full restoration of that important source of supply.

Pig Iron.—Despite a wide divergence in prices, producers and their selling representatives show considerable optimism. That the market is quiet is admitted, but that it is not at a standstill, so far as foundry grades are concerned, is evidenced by the fair aggregate of sales involving small or moderate-sized lots. In some cases consumers are asking that shipments be anticipated and they are quick to protest if there is delay. In recent transactions 3000 tons of foundry, 600 tons of charcoal and 1000 tons of gray forge were named, and the Pennsylvania Railroad has closed for 800 tons of charcoal. The only large inquiry now before the trade is that of the Bethlehem Steel Co., which made known its need of 5200 tons of foundry for Sparrows Point, but that the iron will be purchased is not definitely assured. It is stated that no large accumulation of foundry iron exists, while the requirements of consumers are increasing. Mentioned as justification for optimism is the fact that most of the recent low sellers have taken practically all they care to book at the low figures, and are either not taking further orders or have advanced their quotations. It is a matter of much comment that prices have suffered largely through the activity of producers who do not regularly serve the foundry trade, but who have done so recently. It also is emphasized that July is naturally a slow month and that records for years back show that each August brought several times the amount of business done in July of each respective year.

The variance in quotations is still great, being governed largely by what the producers are most desirous of selling. Unanimity in silicon differentials is lacking as was mentioned a week ago. A producer applying the old 50c. differential has advanced quotations 50c. and now asks \$29, furnace, for No. 2 plain and \$29.50, furnace, for No. 2X. It is trade gossip that in some contracts covering low-priced iron the makers reserved the right to deliver iron under 0.07 sulphur, thereby leaving the way open for off iron, although it is not believed much of the latter will be shipped against these contracts. Bids were taken last week on 3000

tons of basic owned by the Government and stored at the plant of the Standard Steel Works Co., Burnham, Pa. Both dealers and consumers put in bids, the two high bids, both by dealers, being \$25.30, Burnham, for most of the quantity offered, and \$27, Burnham for the remainder.

In Virginia iron a peculiar situation exists in that, with the exception of one producer, all makers ask \$30, furnace, for No. 2 plain, and \$31, furnace, for No. 2X, the freight to Philadelphia being \$4.10. The one maker excepted quotes \$30.60, Philadelphia, for No. 2X, but will not sell No. 2 plain for less than this figure, deliveries on both grades to be in 60 days.

Basic remains inactive. The last sale was at \$26, Eastern furnace, but one seller now quotes \$27.50, furnace, to which must be added a freight of around \$1. There is no inquiry for standard low phosphorus. We quote standard grades of iron for delivery in Philadelphia or vicinity as follows, except that low phosphorus grades are quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	\$29.10 to \$31.10
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	28.60 to 30.60
Virginia No. 2 X (2.25 to 2.75 sil.)	30.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	30.60
Basic	26.00 to 27.00
Gray forge	26.00 to 26.50
Malleable	28.35
Standard low phosphorus (f.o.b. furnace)	35.00
Copper bearing low phosphorus (f.o.b. furnace)	35.00

Ferroalloys.—Makers of domestic standard ferromanganese are more than meeting the quotation of English makers, \$115, seaboard, by quoting \$115, delivered, for 78 to 82 per cent. They say, however, that but a limited tonnage will be offered at this level. The market is quiet. Sixteen to eighteen per cent spiegeleisen is quoted at \$30 to \$35, delivered, and 18 to 22 per cent at \$33 to \$35, delivered. In the week ended July 7 there was an importation of 500 tons of English ferromanganese and 714 tons of manganese ore at this port, the latter shipment coming from Russia in Asia.

Iron Ore.—In the week ended July 14, 10,857 tons of Cuban ore arrived at this port.

Coke.—New River grades of Virginia foundry coke are quoted at \$7.50 to \$8, and Pocahontas at \$6.50 to \$7.50, at ovens. Makers of foundry coke outside the Connellsville district quote \$5.50, ovens. For Connellsville bee-hive and Eastern by-product coke \$5.25 is quoted. Prompt furnace coke is offered at \$4.15 to \$4.25 ovens, and coke for delivery to the end of the year at \$4.65 to \$4.75. Consumers of foundry have about finished contracting.

Semi-Finished Material.—There is some demand but not a great deal for billets. Quotations are firm at \$42.50, Philadelphia for 4 x 4-in. open-hearth rolling billets, forging billets at \$55, Philadelphia, and slabs at \$45, Philadelphia.

Plates.—Very little betterment is shown in plates and at the present rate of operations the mills are losing money. One producer operated its plate mill at but 29 per cent of capacity in the week. At the same time a little betterment is seen in the number of orders coming to hand, though most of these are small. One maker has received so many requests for contracts to cover the last half that it agreed to meet its customers half way and protect them over the third quarter. Some inquiries for ship plates are vaguely reported, but it is said on investigation that the builders have not got the contracts for the ships actually in hand. The largest inquiry of this kind is for 3,000 tons from a Delaware river yard. Price cutting is said to have practically ended, the makers now uniformly quoting 2.895, Philadelphia, although in some quarters it is believed this price can still be shaded, this view being partly based on the fact that a consumer refused to accept a small lot at the full price, although immediate delivery was offered. The rate of operations ranges from 25 to 40 per cent.

Structural Material.—The most encouraging local condition is that architects have considerable work on

their boards which should soon take the form of definite inquiry; also that draftsmen are in greater demand. A few really large propositions, heretofore mentioned, are pending, but they apparently are no nearer fruition. Jobbers and fabricators are taking a little material to fill in their stocks. Despite several attempts to gain concessions from the established quotation of 2.695c. for plain material, that level is generally adhered to.

Bars.—Several makers of iron bars, within the week, have advanced their quotation to a basis of 2.50c., Pittsburgh, or 2.745c. Philadelphia, an influence in this direction probably being the shortage which has developed as a result of the puddlers' strikes at the plant of the Bethlehem Steel Co. and the Lebanon Valley Iron & Steel Co. For ordinary bar iron, 2.595c. Philadelphia, the quotation for mild steel bars, can still be done. Steel bars are unquestionably active, and one maker is not promising delivery earlier than five to seven weeks.

Wire Products.—This is an active market, the best delivery promised on some products being 60 days. For quotations, see page 201.

Bolts, Nuts and Rivets.—Continued improvement in demand is shown following the recent advance in prices. The new discounts f.o.b. Pittsburgh, follow:

Carriage bolts, $\frac{3}{4}$ x 6-in., rolled threads, 60 per cent off; cut thread, 50 and 10 per cent off; larger and longer, 45 and 5 per cent off; small machine bolts, $\frac{3}{4}$ x 4 in., smaller and shorter, rolled threads, 60 and 10 per cent off; cut thread, 60 per cent off; larger and longer, 50 and 5 per cent off; lag screws, 65 per cent off; nuts, square and hexagon blank, \$3.10 off list; tapped, \$2.85 off list.

Old Material.—Though almost entirely a dealers' market because of their confidence that the course of prices will be upward, a few sales are reported and at higher prices. Turnings have been sold at \$14.50 and borings at the same figure. Strength in rerolling rails reflects the strong position of these in the West. Two local mills are reported to be ready to take melting steel at \$19, but dealers are not willing to let go at this price. We quote for delivery at consumers' works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel.....	\$19.00 to \$20.00
Steel rails, rerolling	21.00 to 22.00
No. 1 low phosphorus, heavy, 0.04 and under	23.00 to 24.00
Carwheels	23.00 to 24.00
No. 1 railroad wrought.....	25.00 to 25.50
No. 1 yard wrought.....	21.50 to 22.50
No. 1 forge fire	13.50 to 14.00
Bundled skeleton	13.50 to 14.00
No. 1 busheling	16.00 to 17.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use).....	12.50 to 13.00
Mixed borings and turnings (for blast furnace use)	12.50 to 13.00
Machine-shop turnings (for rolling mill and steel works use).....	13.50 to 14.50
Heavy axle turnings (or equivalent).....	15.00 to 16.00
Cast borings (clean)	14.00 to 15.00
No. 1 cast	22.00 to 23.00
Grate bars	18.00 to 19.00
Stove plate	18.00 to 19.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications).....	18.50 to 19.50
Ungraded pipe	13.00 to 14.00

Buffalo

BUFFALO, July 14.

Pig Iron.—The market has subsided to a quieter state than has existed for some weeks past. Although inquiry and orders are of more moderate aggregate, there is continued general inquiry and the market has settled down to a steady demand for smaller sized tonnages, with some belated requirements for melters who did not anticipate so heavy a run of business from their customers as has developed, and they are now endeavoring to secure sufficient additional iron to provide necessary quantities to last them through the remainder of the year. They are finding it more difficult to procure than would have been the case if they had been ready to contract for the required tonnage a month ago. Special irons are being sought in some

instances and there is a very good volume of specification on existing contracts. The largest inquiry reported is for 5,500 tons of foundry, and another is for 2,000 to 3,000 tons of malleable. It is estimated that 30,000 tons will cover the total orders for the week. Two producing interests of the district are now virtually out of the market until the end of the year, one having withdrawn definitely and the other having very little untaken last half product to act on. All sellers are holding firmly to the March 21 schedule for regular grades, the only deviation noted being the sale of a small tonnage of off-grade iron taken at 50c. per ton reduction. Nothing else approaching price cutting has been heard of. We quote f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$29.75
No. 2X, 2.25 to 2.75 silicon.....	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon	\$26.25 to 27.00
Gray forge	25.75 to 26.00
Malleable, silicon not over 2.25.....	27.25
Basic	25.75
Basic, 1 to 1½ per cent manganese.....	26.25
Basic, 1½ to 2½ per cent manganese.....	26.75
Bessemer	27.95
Lake Superior charcoal, regular grades, f.o.b. Buffalo	32.35

Finished Iron and Steel.—There has been no mid-summer lull or interruption in the activities prevalent in the finished products market during the past few weeks. Specifications received during the week have been heavy for bars and structural material, sheets, wire products and piping. The demand for the latter product has been of unusually large volume. It is understood several producers are declining to accept orders except from regularly established customers, and are cutting down the proportion of lap-welded tonnage to the well established trade in some instances. Good export demand is reported for wire and plates. The John W. Cowper Co., Buffalo, has the contract for factory extension for the Alberger Pump & Condenser Co., Newburgh, N. Y., requiring about 100 tons of fabricated steel; and the contract with the American Radiator Co. for a foundry extension at Springfield, Ohio, requiring a small tonnage.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28 galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Old Material.—Market conditions have improved greatly during the week and prices have tightened. Local demand for heavy melting steel is increasing now that mills have crept up to an average production of 75 per cent of capacity and dealers say they see grounds for belief that a much larger demand will be in evidence in the near future, and the comparatively low stocks in the hands of consumers and in dealers' yards gives some foundation for this belief. One local mill is reported to have purchased heavy melting at \$18, and a Valley mill has bought here at \$20.50 delivered—equivalent to \$18.10 or \$18.15, Buffalo. Dealers are hanging on to their stocks and not disposing of any large tonnages, anticipating a rise to \$20 in the near future. The general demand for nearly all commodities is good. Cast scrap is about the only one that shows lack of strength in comparison with the rest of the list. Machine shop turnings and wrought pipe have each advanced \$1.00 per ton. We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades.....	\$17.50 to \$18.50
Low phosphorus, 0.04 and under.....	21.00 to 22.00
No. 1 railroad wrought.....	20.00 to 20.50
No. 1 machinery cast.....	22.50 to 23.00
Iron axles	26.00 to 27.00
Steel axles	26.00 to 27.00
Carwheels	22.50 to 23.50
Railroad malleable	19.00 to 20.00
Machine shop turnings	9.00 to 10.00
Heavy axle turnings.....	13.00 to 14.00
Clean cast borings.....	11.50 to 12.50
Iron rails	23.00 to 24.00
Locomotive grate bars.....	19.00 to 20.00
Stove plate	19.00 to 20.00
Wrought pipe	16.00 to 17.00
No. 1 busheling	14.00 to 15.00
Bundled sheet stamping.....	12.00 to 13.00

New York

NEW YORK, July 15.

Pig Iron.—The sales of pig iron during the last week have not been numerous but the tone of the market is stronger, and the general opinion among sellers is that higher prices will prevail. This opinion is based largely on the expectation that the steel business will show decided improvement toward fall and also on the indications that there is likely to be a shortage of coke before many months. Already a shortage of labor is complained of in the coke regions and laborers continue to return to Europe. The largest sale was 7000 tons of basic by a Buffalo company for delivery in the third quarter in New England. The largest tonnage pending is 6000 tons of foundry for the last quarter of this year. This is likely to be placed before the end of the week. Sales included 600 tons of foundry iron for the first half of next year and 200 tons for the third quarter of this year. The largest active inquiry for export is one for 5000 tons which will be placed this week if a satisfactory freight rate can be obtained. Another inquiry for 2000 tons of foundry iron which was in the market some time ago for export has been revived. Considerable variation in prices continues, although Buffalo furnaces seem to be adhering firmly to \$28, furnace, for No. 2 X, the \$27 quotation on resale Buffalo iron has not yet disappeared. In the case of Virginia furnaces, one seller is still quoting \$26.50, furnace, for No. 2 X, but other furnaces are considerably higher. We quote as follows, delivered New York, for Northern and Southern grades, quotations on the latter being nominal:

No. 1 foundry, silicon, 2.75 to 3.25.....	\$30.80 to \$31.30
No. 2 X, silicon, 2.25 to 2.75.....	30.30 to 30.80
No. 2 plain, silicon, 1.75 to 2.25.....	29.80 to 30.30
No. 2 X, Virginia, silicon, 2.25 to 2.75.....	31.40 to 31.90
No. 1 Southern, silicon, 2.75 to 3.25.....	32.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75.....	30.70
No. 2 Southern (all rail), sil., 1.75 to 2.25.....	29.45

Ferroalloys.—American producers of ferromanganese have generally reduced their quotation from \$125 to \$115, delivered, making the alloy on a parity with the British price, which is still \$115, seaboard. Demand is insignificant and consists of a few sales of carload lots for early delivery. There are no important inquiries before the market. An interesting development in the spiegeleisen market is the fact that Germany and Austria are already making inquiries for spiegeleisen in this market. It is also true that a fair amount of business has been done for export. To domestic consumers about 1500 tons has been sold, mostly for last half delivery, and there are a few inquiries before the trade. Quotations are firm at \$35, furnace, for 18 to 22 per cent alloy, and it is expected in some quarters that as high as \$40 will obtain in the near future. Ferrosilicon, 50 per cent, is unchanged at \$75 to \$80 per ton, delivered, with demand moderate.

Finished Iron and Steel.—Good-sized bookings in the last few weeks on export account have extended deliveries, a matter of five or six weeks, with a number of mills, even in bars. Buying on domestic account is not of itself of any proportions in the East. There is little doing in steel plates, but the improvement in the structural market still continues. In fact, general contractors are figuring on prospective work which totals almost unbelievable figures. The largest fresh projects include 2600 tons for the Wurlitzer Piano building, Forty-first Street, awarded to the Levering & Garrigues Co., and 2700 tons for the Metropolitan Life Insurance Co.'s additional building, now up for figures. Other structural steel work in the market includes 450 tons for the Warren cotton mills, New England; 450 tons for the Stanley theater, Philadelphia, and 500 tons for a Y. M. C. A. building, Bayonne. The awards of the week include 1150 tons for a loft building, Forty-first Street and Sixth Avenue, to the George A. Just Co.; 500 tons for the Stock Exchange addition to the Levering & Garrigues Co., and 600 tons for storehouse at Quantico to the McClintic-Marshall Co. Of the outstanding things in the structural market are recurring instances of low bids made on erection work. Apparently all bolt and nut makers

in the East have increased prices 5 per cent. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Cast Iron Pipe.—The market continues dull as to both municipal and private buying, but in some cases higher prices have been paid for small tonnages than prevailed on recent large sales at Boston and other Eastern points. We quote New York prices as follows: 6-in. and heavier, \$50 to \$52.30; 4-in., \$53 to \$55.30; 3-in., \$60 to \$62.30 and \$1 additional for class A and gas pipe.

Old Material.—There is considerable activity in heavy melting steel, pipe and borings and turnings. There is also a fair demand for cast scrap from New England, but foundries in New York and Brooklyn are buying very little material. In heavy melting steel, two distinct grades are now recognized, one the ordinary heavy melting steel and the other steel rails or equivalent. The equivalent often is high grade scrap which is being disposed of by the Government at about \$1 above the price of heavy melting steel. One large steel company in eastern Pennsylvania has been buying ordinary heavy melting steel freely, another one has taken a considerable tonnage of the heavy steel of higher grade. Some buyers are paying high prices as a speculation, depending on active demand later. Hope is entertained that there will be demand for a large amount of scrap from Italy and perhaps other foreign countries. Some inquiry from Italy has recently appeared, but no sales have been made. Dealers' and brokers' buying prices, New York, follow:

Old steel rails (or equivalent).....	\$15.00 to \$16.00
Heavy melting steel.....	14.50 to 15.00
Rerolling rails.....	17.50 to 18.00
Relaying rails, nominal.....	40.00 to 41.00
Steel car axles.....	24.00 to 25.00
Iron car axles.....	27.00 to 28.00
No. 1 railroad wrought.....	22.00 to 23.00
Wrought iron track.....	16.00 to 17.00
Forge fire.....	10.00 to 10.50
No. 1 yard wrought, long.....	18.00 to 18.50
Light iron.....	6.00 to 7.00
Cast borings (clean).....	10.00 to 10.50
Machine shop turnings.....	10.00 to 10.50
Mixed borings and turnings.....	8.00 to 8.50
Iron and steel pipe (1 in. minimum diameter) not under 2 ft. long....	15.00 to 15.50
Stove plate.....	16.00 to 16.50
Locomotive grate bars.....	16.00 to 16.50
Malleable cast (railroad).....	15.00 to 16.00
Old carwheels.....	20.00 to 20.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast.....	\$23.00 to \$23.50
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	21.50 to 22.00
No. 1 heavy cast, not cupola size.....	16.00 to 16.50
No. 2 cast radiators, cast boilers, etc.....	17.50 to 18.00

Birmingham

BIRMINGHAM, ALA., July 14.

Pig Iron.—The Birmingham iron market is stronger and stiffer. An instance: A Middle Western consumer has offered to place 1,500 to 2,000 tons of 2.25 to 2.75 silicon for fourth quarter delivery at \$27.50, which is 50c. under the Redfield schedule, with silicon differentials. The maker who declined this is sold through the third quarter to capacity and is out of the market, confident that iron will reach \$30 within 30 to 60 days. The present largest producer of foundry iron is also sold through the third quarter and says it is out of the market pending an expected advance. A third interest will take fourth quarter business on the Redfield schedule with silicon differentials and without freight absorption to any territory, but will not budge from that basis. This interest booked 1,000 tons immediately after notice was placed. The leading foundry interest, which never yielded to the lower prices in full, is as firm for the Redfield schedule as any of them, and has been making sales at that level. Parties securing Birmingham iron now under the Redfield basis may be considered as in the favored class. The Woodward Iron Co. now has four

stacks going, the Republic company is blowing in a second one this week and the Sloss-Sheffield company is blowing in a third stack in Birmingham. The Gulf States Steel Co. will also blow in on basic, besides resuming in steel-making departments. Hoop and tie mills are on double turn. All steel mills are taking on speed. Southern consumers realize the iron situation and accept the Redfield schedule as fixed. One concern has shipped several thousand tons for western European delivery and other interests are reported to be booking some export business. A freight rate of as low as \$10 to gulf ports has been made. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.75 to 2.25 silicon.....	\$25.75
Basic	24.75

Cast-Iron Pipe.—Sanitary pipe shops expect good business for six months to come in response to building activity. So far they have kept up with deliveries. The demand is from all over the country. Operations are around 60 per cent of capacity and would be larger if labor could be secured. Water and gas pipe shops are taking on comfortable additions to prior bookings with prospect of enlarging. Prices tend toward a hardening.

Coal and Coke.—The Woodward Iron Co. has its by-product works in full operation again and Newcastle is firing beehive ovens. Furnace coke is more active. Standard foundry coke is going well at \$9.

Old Material.—Scrap dealers have not succeeded in securing higher offers for heavy steel, but are reported as buying new stocks at prices above those at which they could now sell; in other words, are banking on the future. Cast and stove plate alone are active.

We quote per gross ton f.o.b. Birmingham district yards prices to consumers as follows:

Steel rails	\$14.50 to \$15.00
No. 1 heavy steel.....	13.50 to 14.00
Cast iron borings.....	7.50 to 8.00
Machine shop turnings.....	7.50 to 8.00
Stove plate	17.00 to 18.00
No. 1 cast	22.00 to 22.50
Car wheels	22.00 to 22.50
Tramcar wheels	21.50 to 22.00
Steel axles	22.00 to 23.00
No. 1 wrought	14.00 to 15.00

Cleveland

CLEVELAND, July 15.

Iron Ore.—There has been very little activity in the ore market during the past week, sales being limited to a few small lots. Many of the furnaces that still have good stock piles carried over from last winter have not yet bought any 1919 ore. Sales include a 30,000-ton lot to an Eastern consumer. There has been some demand recently for silicious ores on which prices are not firm. Quotations range from \$3.25 to \$3.75 for ore containing 40 per cent of iron dry, the price depending somewhat on the phosphorus content. Lake Erie docks received 5,934,757 gross tons of ore in June, as compared with 7,723,937 tons the same month a year ago. Receipts at the same docks for the season until July 1 were 11,413,986 tons, as compared with 13,584,785 tons during the same period a year ago. Shipments from Lake Erie docks during June were 4,176,685 tons, as compared with 5,527,367 tons during June, 1918. The dock balance July 1 was 6,310,141 tons, a slight increase over July 1, 1918, when there was 6,267,997 tons of ore on Lake Erie docks. Ore prices delivered f.o.b. lower lake ports, are as follows:

Old range Bessemer, \$6.45; old range non-Bessemer, \$5.70; Mesaba Bessemer, \$6.20; Mesaba non-Bessemer, \$5.55.

Pig Iron.—There is an increased volume of inquiry for foundry and malleable iron for the first half of next year, but furnaces so far have not quoted for that delivery except in a few cases in which sales made for the last half or fourth quarter also included iron for the first quarter. Some producers have not yet definitely decided whether to take on first-half iron at the present time, but they are not inclined to do so be-

cause of the uncertainty as to future costs because of the labor situation, and they think that prices may go higher within the next few months. First-half inquiries are for lots up to 3,000 and 5,000 tons, and have come largely from foundries engaged in automobile work. Sales during the week were rather light compared with the volume of business that was booked during the recent buying movement. However, some sellers booked a fair volume of new orders. Steel-making iron is inactive, the only sale reported being 2,000 tons of Bessemer iron by a Cleveland interest to a Pittsburgh district consumer for early shipment at the regular price. The concessions that have been made by some of the Southern producers on high silicon foundry iron have apparently disappeared, as several small lot sales of Southern iron were made in the Cleveland territory during the week at regular prices. Because of the Jackson County strike, which has resulted in the shutting down of the furnaces of three out of four producers of silvery iron, selling agents have been instructed to book no further orders for silvery iron. Strikes in some foundries in this territory have resulted in the holding up of shipping orders on foundry iron. We quote delivered Cleveland, as follows:

Bessemer	\$29.35
Basic	26.15
Northern No. 2 foundry, silicon, 1.75 to 2.25..	27.15
Southern foundry, silicon, 2.25 to 2.75.....	33.00
Gray forge	26.15
Ohio silvery, silicon, 8 per cent.....	42.65
Standard low phos., Valley furnace..	\$38.00 to 40.00

Ferroalloys.—The price of ferromanganese, which was recently advanced to \$125, after sales were being made at \$110, has been reduced to \$115, delivered, for 80 per cent, for domestic makes. English ferromanganese has been reduced to \$115 Eastern seaboard. A few small lot inquiries are pending.

Finished Iron and Steel.—The demand for finished steel is showing a further gain and is very active in practically all lines except plates. A good volume of current orders and heavy specifications has come out during the past few days and mills are beginning to get behind on shipments. One mill is now two or three months behind on deliveries on steel bars and angles in small sizes, and another is out of the market on wire products and tubular goods. In semi-finished steel, specifications for sheet bars have improved materially and strip mills are now specifying freely on billet contracts. Orders are light but prices are firm. Demand for structural material and for reinforcing bars for building work is heavy. The Massillon Bridge & Structural Co. has taken 500 tons for the Stone Building, Massillon, and bids have been taken for 3600 tons for the Hanna Building, Cleveland. Inquiries include a mill building for the American Rolling Mill Co., Middletown, Ohio, 3800 tons; a building for the Detroit Edison Co., Detroit, 2000 tons; a bridge at Jacksonville, Fla., 2700 tons; a library, Chicago, 2500 tons; Baltimore and Ohio Railroad bridge, 500 tons, and a building for the Maumee Malleable Casting Co., Toledo, 200 tons. In reinforcing bars, 850 of rerolled bars have been placed for the sewage disposal plant and 250 tons for the Crown Building, Cleveland. Hard steel bars are firmer, but still somewhat irregular. There has been some late shading of the 2.25c. price, but most of the makers are now quoting 2.35c. The \$1.50 per ton extra on deformed bars in common steel is now being waived by most of the makers, this practice having been started some time ago by mills re-rolling these bars from shell steel. However, the extra is not being waived on cold-twisted bars. The demand for shafting has improved, but prices are irregular in that some mills are taking less than car-load orders at 28 per cent discount, the regular car lot price. Regular prices are now being maintained on light rails, a Pittsburgh district mill that has been selling these rerolled from shell steel at 2.05c. having no more rerolled rails to offer. Plate prices are still being shaded \$2 to \$3 per ton by some of the smaller mills. The demand for all grades of sheets is heavy, and some of the mills are filled for the third quarter. Some of the Detroit automobile companies are placing

sheet contracts for the fourth quarter and the Ford Motor Co. has inquired for 20,000 tons for delivery up to next July. While sheet prices are much firmer, shading to the extent of \$2 per ton is reported on blue annealed sheets. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Bolts, Nuts and Rivets.—Specifications on bolt and nut contracts are heavy, and some small current orders are being placed at the new prices, which makers claim are being well maintained. Nearly all of the large consumers covered for their third quarter and last half requirements before the price advance. Rivet specifications are heavy, and some makers are withdrawing old prices and advising their trade that they will quote prices on application. Prices on boiler and structural rivets were not advanced when bolt and nut prices were marked up, and while no quotations are reported at higher than the regular prices, a price advance is expected owing to the increased costs due to the labor situation. Some makers are now quoting small rivets at 65 and 5 per cent off the list, and others at 60, 10 and 5. Usual quotations for this territory follow:

Large structural and ship rivets	.....	\$3.70 base
Large boiler rivets	.....	\$3.80
1/4 in., 5/16 in. and 7/16 in. diam.	.....	60-10-5 per cent off list
Machine bolts, hp. nuts, 1/2 in. x 4 in.	.....
Smaller and shorter, rolled threads	.....	60-10 per cent off list
Cut threads	.....	50-10-10 per cent off list
Larger and longer sizes	.....	50-5 per cent off list
Machine bolts, c.p.c. and t. nuts, 1/2 in. x 4 in.	.....
Smaller and shorter	.....	45-10-5 per cent off list
Larger and longer	.....	40-10 per cent off list
Carriage bolts, 1/2 in. x 6 in.	.....
Smaller and shorter, rolled threads	.....	50-10-10 per cent off list
Cut threads	.....	50-10 per cent off list
Larger and longer sizes	.....	45-5 per cent off list
Lag bolts	.....	65 per cent off list
Plow bolts, Nos. 1, 2 and 3	.....	50-10-5 per cent off list
Hot pressed nuts, sq. blank	.....	3.10c. per lb. off list
Hot pressed nuts, hex. blank	.....	3.10c. per lb. off list
Hot pressed nuts, sq. tapped	.....	2.85c. per lb. off list
Hot pressed nuts, hex. tapped	.....	2.85c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	.....	3.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	.....	2.85c. per lb. off list
Semi-finished hex. nuts:	.....
1/2 in. and larger	.....	70-10 per cent off list
9/16 in. and smaller	.....	80 per cent off list
Stove bolts in packages	.....	75-10-10 per cent off list
Stove bolts in bulk	.....	2 1/2 per cent extra
Tire bolts	.....	60-10-10 per cent off list

The above prices are from July 1, 1919.

All prices carry standard extras, Pittsburgh basis.

Old Material.—Dealers and consumers are far apart on scrap prices and both are marking time. The market is very firm, but not active. Dealers are paying as high as \$20 for heavy melting steel to fill old contracts, and not a great deal of material is coming out at that price. Mills, on the other hand, are not willing to pay over \$18 for heavy melting steel and have good stocks, so that few of them will have to come in the market for material for some time. Some steel scrap has been offered to local mills at \$19.50, but consumers refused to consider taking the material at that price. Borings and short turnings are in good demand for blast furnace use, but other grades, aside from heavy melting steel, are quiet. A sale of No. 1 busheling scrap to a Cleveland mill at \$18 is reported. Prices are practically the same as a week ago. We quote delivered consumers' yards in Cleveland and vicinity per gross ton, as follows:

Heavy melting steel	.....	\$19.50 to \$20.00
Steel rails, under 3 ft.	.....	21.00 to 22.50
Steel rails, rerolling	.....	21.00 to 22.00
Iron rails	.....	25.00 to 26.00
Iron car axles	.....	31.00 to 33.00
Steel car axles	.....	29.50 to 30.50
Low phosphorus melting scrap	.....	22.50 to 23.00
Cast borings	.....	12.50 to 13.50
Iron and steel turnings and drillings	.....	11.00 to 12.00
Compressed steel	.....	17.00 to 18.00
No. 1 railroad wrought	.....	21.50 to 22.50
Cast iron car wheels	.....	24.00 to 25.00
Agricultural malleable	.....	17.00 to 18.00
Railroad malleable	.....	20.00 to 21.00
Steel axle turnings	.....	16.00 to 17.00
Light bundled sheet scrap	.....	15.00 to 16.00
No. 1 cast	.....	23.50 to 24.50
No. 1 busheling	.....	18.00 to 19.00
Drop forge flashings, 10 in. and under	.....	15.00 to 16.00
Drop forge flashings, over 10 in.	.....	12.50 to 13.00
Railroad grate bars	.....	19.00 to 20.00
Stove plate	.....	19.00 to 20.00

Coke.—Most of the foundries in this territory have covered for their coke requirements for the last half, and the market now is rather quiet. Some of the producers have withdrawn from the market, having taken orders for all the coke that they dare place on their books because of the increasing scarcity of labor. Spot foundry coke is fairly plentiful. We quote standard Connellsville foundry coke at \$5.25 per net ton at oven for prompt shipment for the last half.

Cincinnati

CINCINNATI, July 15.

Pig Iron.—Business has caused Southern makers to adopt the regular schedule of \$26.75 for 1.75 to 2.25 silicon, and \$28, Birmingham, for 2.25 to 2.75. As there is no speculative iron in the south of consequence these prices are now considered the minimum.

A few southern furnaces are still holding back selling for the fourth quarter and so far none has put out any figures for the first quarter of next year, although some tentative inquiries have been issued.

As to the northern situation, all furnaces in Southern Ohio are now holding strictly to the schedule. The Norton furnace is understood to have sold all the foundry iron it cares to dispose of and it has withdrawn from the market. Several medium-sized lots of both northern and southern iron were disposed of last week for nearby shipment at the full schedule.

Stove makers have bought quite freely recently. Although it is generally predicted that another buying wave is in sight, the number of inquiries has fallen off considerably within the past few days. There is no demand for either basic or malleable. All of the silvery furnaces in Jackson Co., Ohio, are still closed down, because of labor trouble.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25	.....	(base price)	\$28.60 to \$29.10
Southern coke, silicon, 2.25 to 2.75	.....	(No. 2 soft)	29.10 to 29.60
Ohio silvery, 8 per cent silicon	.....		42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	.....		28.55
Basic, Northern	.....		27.55
Standard Southern carwheel	.....		51.60
Malleable	.....		29.05
Lake Superior charcoal	.....		32.35 to 33.35

Coke.—A large producer in the Connellsville district has withdrawn from the market entirely, and it is rumored that others are expected to take similar action. Wise County and New River producers are also fairly well sold up and are not overly anxious for any new business. Connellsville furnace coke is now quoted at \$4.25 to \$4.50 per net ton at oven, and foundry coke at \$5.25 to \$5.50. Wise County and Pocahontas foundry coke prices are around \$6.50 to \$6.75. However, one Wise County interest is holding firmly at \$7.50 at oven, but is booking no business at this figure. New River foundry coke is unchanged at \$7.50 to \$8. No contracts for shipment next year will be accepted by any producers.

Finished Material.—An independent mill has issued a new card on steel pipe dated July 10, advancing the price 2 1/2 per cent, or approximately \$5 a ton. Business is exceptionally good and as most mills are loaded up, it is not certain as to whether they will follow this advance. A much better demand for wire nails has developed and the jobbers' quotation is unchanged at \$3.75 per keg base. Cold rolled shafting also shows some improvement and the discount of 5 per cent off list rules on all outside shipments. Sheets are firmer and the regular quotations of 4.35c. Pittsburgh for No. 28 black sheets and 5.70c. for No. 28 galvanized seem to be well maintained. There is a good demand also for blue annealed sheets and No. 10 gage sheets are quoted from jobbers' stocks at 4.53c. Reinforcing concrete rods are being drawn from jobbers' stocks in larger quantities, and there is also a better call for small structural shapes.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, 1/4-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., wire nails, \$3.75 per keg base.

High-Speed Steel.—Orders are coming in at a fair rate for this season of the year, but consumers of high-speed steel do not seem to be inclined to buy any more stocks than to take care of their immediate needs. Standard brands are unchanged at \$1.50 per lb.

Fluorspar.—Washed gravel fluorspar is unchanged at \$25 per ton at point of shipment. Very little is being sold and practically no contracting is under way for future shipment.

Non-Ferrous Metal Scrap.—The red metals are moving better and all quotations have been advanced. Heavy copper is quoted to-day at 16.50c. to 17c.; light copper at 14.25c., heavy red brass at 16.50c. and red brass borings around 13c. Block tin pipe is in fair demand and is quoted at 58c. to 60c. Lead is unchanged at 4.25c.

Old Material.—Although this seems to be a dealers' market and there is an absence of any heavy buying on the part of the steel mills, nearly all kinds of scrap registered an advance. Rerolling steel rails advanced about \$2 a ton and steel rails for melting almost as much. The foundries are buying scrap a little more freely, but they do not seem to be inclined to take on any large tonnages for future shipment. Railroad offerings are conspicuous by their absence. The following are dealers' buying prices f.o.b. at yards, in carload lots, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	\$12.00 to \$12.50
Old iron rails	22.75 to 23.25
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	21.50 to 22.00
Heavy melting steel	16.00 to 16.50
Steel rails for melting	16.00 to 16.50
Old carwheels	19.00 to 20.00
No. 1 railroad wrought	18.00 to 18.50
Per Net Ton	
Cast borings	\$8.00 to 8.50
Steel turnings	7.00 to 7.25
Railroad cast	21.00 to 22.00
No. 1 machinery	22.00 to 23.00
Burnt scrap	13.00 to 14.00
Iron axles	25.00 to 26.00
Locomotive tires (smooth inside)	15.00 to 16.00
Pipes and flues	14.00 to 16.00
Malleable cast	15.00 to 16.00
Railroad tank and sheet	12.00 to 13.00

St. Louis

ST. LOUIS, July 15.

Pig Iron.—The buying is improving with sales for third quarter about 5000 tons. Buyers are ordering according to actual needs and refraining from accumulating stocks in yards. Prices show no disposition to change either way and the differential between Northern and Southern iron is generally maintained. Northern sales are mostly made by traveling representatives, as Northern furnaces are not very generally represented here.

Coke.—No business of particular importance has developed in coke, existing contracts generally covering all needs not otherwise already provided for. This applies to both bee-hive and by-product coke. Domestic coke demand is quiet. Higher prices, however, are being generally anticipated as the season develops.

Finished Iron and Steel.—Growing needs are increasing the demand for finished products, but at that no new large contracts are being entered into, although the aggregate volume of purchases is continuing more satisfactory. The buying from warehouses is growing as needs of the more immediate character increase which cannot depend upon shipments from the mills. Building operations are taking on a wider scope and considerable construction work is expected during the coming fall. For stock out of warehouse we quote as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—The market is running away again, due to speculation of dealers, as consumers are not buying locally, although the Chicago and Eastern buyers

have made purchases which probably accounts for the dealers' speculative attitude. The result is St. Louis prices have advanced and are generally out of line with other markets, because of local conditions. At the Government sale of billets at the Curtis & Co. plant, to-day, 4385 tons, the highest bid was \$31.50, but award was withheld pending advices from Washington, with relation to the certified check deposited by high bidder, which was not for full 10 per cent of total amount bid. Lists out include Missouri, Kansas & Texas, 800 tons; Frisco, 1000 tons; Terminal Association, 1200 tons; Mobile & Ohio, 1000 tons; Wabash, 1900 tons, all bringing top prices, due to dealers' speculative attitude. The larger dealers, while participating in the activity, are turning over purchases quickly whenever profit appears, rather than take the chances involved in holding material.

Per Gross Ton	
Old iron rails	\$23.00 to \$23.50
Old steel rails, rerolling	24.00 to 24.50
Old steel rails, less than 3 ft.	21.50 to 22.00
Relaying rails, standard sections, subject to inspection	34.00 to 37.00
Old carwheels	24.00 to 24.50
No. 1 railroad heavy melting steel	19.00 to 19.50
Heavy shoveling steel	17.00 to 17.50
Ordinary shoveling steel	16.00 to 16.50
Frogs, switches and guards, cut apart	19.50 to 20.00
Ordinary bundled sheets	11.25 to 11.75
Heavy axle and tire turnings	13.00 to 13.50

Per Net Ton	
Iron angle bars	\$18.50 to \$19.00
Steel angle bars	17.50 to 18.00
Iron car axles	31.00 to 31.50
Steel car axles	29.00 to 29.50
Wrought arch bars and transoms	22.50 to 23.00
No. 1 railroad wrought	18.50 to 19.00
No. 2 railroad wrought	17.50 to 18.00
Railroad springs	18.00 to 18.50
Steel couplers and knuckles	18.00 to 18.50
Locomotive tires, 42 in. and over, smooth inside	18.50 to 19.00
No. 1 dealers' forge	15.50 to 16.00
Cast iron borings	10.00 to 10.50
No. 1 bushelling	16.00 to 16.50
No. 1 boiler cut to sheets and rings	15.00 to 15.50
No. 1 railroad cast	23.50 to 24.00
Stove plate and light cast	18.50 to 19.00
Railroad malleable	16.50 to 17.00
Agricultural malleable	16.00 to 16.50
Pipes and flues	16.00 to 16.50
Heavy railroad sheet and tank	14.50 to 15.00
Railroad grate bars	18.00 to 18.50
Machine shop turnings	10.00 to 10.50
Country mixed	14.50 to 15.00
Uncut railroad mixed	16.00 to 16.50
Horseshoes	20.00 to 20.50

San Francisco

SAN FRANCISCO, July 8.

The number of inquiries for many of the fabricated materials which are daily being received lends a hopeful aspect to the market. The jobbers say that the general impression seemed to prevail that an increase in prices was due on the first of the month and that this had the effect of speeding up orders to a certain extent. It also brought out a large number of inquiries, which indicate a good market as soon as the general resumption of business gets well under way. It is pointed out that the farmers and fruit growers of this State have record crops and that prices for their products were never so high. This indicates a large and general distribution of funds as soon as the crops are gathered. It is not a matter of selling, as most of the crops have been fully contracted for and payments wait on delivery alone. The recent election in this State, when \$40,000,000 in bonds were voted for the purpose of building roads, also means a wide distribution of a large amount of money. A large number of bridges, which will require considerable amounts of steel, will be built.

Finished Material.—There has been some cutting in the price of bars on individual sales, although ostensibly prices remain the same. Reinforcing bars in small lots are being freely bought. The Metropolitan Life Insurance Co. is building an addition to its structure in this city and has called for bids on 500 tons of shapes. The Jacklin residence, a private home, has

called for prices on 300 tons. There is no movement in either sheets or plates. A number of cities and towns in the State are preparing to issue bonds for the building of water works and for water works' extensions. These places will undoubtedly be in the market for pipe in the near future. The oil fields also are doing more drilling than for some time past and this market promises to develop a larger demand. The price of cast iron pipe is stiffening and it is now strong at the \$45 base. It is said that there is now practically no cutting of price and the demand is on the up-grade.

Pig Iron.—This market is unchanged. There has been some talk of making pig iron on the Coast, as scrap grows scarce, but so far as can be learned, no serious move in this direction has yet been taken.

Coke.—With the general slowing down of work at the foundries the demand for coke shows a falling off. The users seem to have sufficient on hand for their immediate needs and some report they have several months' supply at the present rate of work. With the increase of the demand for castings the demand for coke will show a decided increase.

Old Material.—The scrap situation is somewhat complicated. It is reported that there is a considerable amount in the States to the north of California, and the mills and foundries here seem to be getting enough to meet their needs. The local dealers, however, report that their stocks are at a low ebb and that they are getting in small amounts. The mills are said to be offering \$17 per net ton in the country for ordinary mill country scrap delivered at points in the San Francisco district. This is the price some of the foundries are paying, while others say they have all the scrap they need for the present and are not in the market. Steel scrap from the shipyards is all under contract and practically none of it comes into the open market. Its price is fixed at \$1.50 over the price of ordinary scrap. A local broker recently canvassed the situation south of Fresno and says that section is entirely cleaned out of scrap, with the yards of the dealers bare, and none in original hands.

Chicago

CHICAGO, July 15.

The leading interest recently booked orders for 35,000 tons of steel for nine vessels to be built on the Pacific Coast. Two local car builders are inquiring for 16,000 tons of plates, shapes and bars to be used for freight car repairs. Other inquiries and orders for finished material are for smaller tonnages, but in the aggregate they represent a good volume of business. Some foreign business is being offered, but under terms as to price and delivery that are for the most part unattractive. Montevideo, Uruguay, is in the market for about 1800 tons of tramway rails.

Southern furnaces are no longer willing to absorb freight on pig iron for Northern delivery.

Pig Iron.—The Southern interest which has been selling foundry, 2.75 to 3.25 per cent silicon, on a Chicago base for third quarter delivery, and which recently announced its willingness to deduct \$1 from the freight on all grades of foundry for fourth quarter delivery, is no longer offering any concessions whatever to secure Northern business. As the situation now stands, therefore, all Southern furnaces are again on a Birmingham base of \$26.75 and are charging the full freight to Northern points of delivery. There has been a revival of activity in the market and sellers expect the sales of foundry and malleable for this month to equal or exceed the business done in June. In general, sales of charcoal are small, ranging from carload lots up to 200 tons. There was one recent sale, however, of 2000 tons and there is an inquiry before the trade for 500 tons. Among other inquiries are two for 500 tons each of foundry, one of which calls for Southern iron running from 4.25 to 4.75 per cent silicon. An order for 600 tons of copper bearing low phosphorous has

been placed in this district. Three silvery furnaces in Jackson County, Ohio, have been forced to blow out because of labor difficulties.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon, 1.50 second half delivery, f.o.b. furnace, average freight to Chicago \$2.50 (other grades subject to usual differentials).....	\$29.25
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	29.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75 (nominal)	33.00
Southern foundry silicon, 1.75 to 2.25 (nominal)	31.75
Malleable, not over 2.25 silicon.....	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	40.00
Silvery, 7 per cent.....	42.05

Structural Material.—Though plans are being drawn for a number of large structures, most of the current inquiries are small. The Whitman & Barnes Mfg. Co., West Pullman, Ill., has awarded 601 tons for a forge shop to the American Bridge Co., and is inquiring for 130 tons additional for a boiler shop. Other recent awards included:

Edison Electric Appliance Co., extension to plant, Chicago, 454 tons to Milwaukee Bridge Co.
United States Food Products Corporation, building at Peoria, Ill., 400 tons to Lucas Iron Works, Peoria, Ill.
National Improvement Co. building at Kansas City, Mo., 162 tons to American Bridge Co.

The Leonard Construction Co., Chicago, is inquiring for additional material for the Beacon Oil Co., Everett, Mass., including 257 tons for condenser boxes. The Chicago *Tribune* is having plans drawn for a large office building to be erected at Austin Avenue and Saint Claire Street, Chicago.

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Bars.—Agricultural implement manufacturers generally are contracting for their last half requirements of soft steel bars. The demand for bars for reinforcing purposes is steadily increasing and business in good volume continues to come from jobbers and manufacturers. Mild steel bar mills have considerable work ahead and rail carbon production is on a more satisfactory basis. The leading independent will put its hard steel bars mill on double time this week. Bar iron business continues dull, but is slightly better than for some weeks, owing to the receipt of specifications from the railroads.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50c. to 2.62c. Chicago; rail carbon, 2.45c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Plates.—Within the past three weeks, the leading interest has booked orders for 35,000 tons of plates, shapes and bars for nine vessels to be constructed in the Puget Sound district. Two local car builders are in the market for an aggregate of 16,000 tons of plates, shapes and bars to be used for freight car repairs. Another current inquiry calls for from 800 to 1,000 tons of plates and shapes for car underframes. The mills, which are enjoying healthy domestic trade, are taking less interest in export inquiries than was anticipated. Although considerable foreign business is being offered, most of it is conditional on compliance with unfavorable stipulations as to price and delivery.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Sheets.—Mills have booked sufficient business to insure operation for from two to four months. One important interest is accepting no new orders for light sheets except for delivery after October. It is, however, in a position to take orders for heavy jobbing

sizes for September delivery. Mill operation is impeded by a shortage of skilled labor.

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c., and No. 28 galvanized 6.72c.

Wire Products.—Business continues good, the demand for nails being particularly strong. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 201.

Rails and Track Supplies.—Montevideo, Uruguay, is inquiring for about 1,800 tons of tramway rails. There have been some small purchases of track supplies.

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.75c., f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Bolts and Nuts.—As announced last week, bolts have advanced 5 per cent and small rivets 10 per cent. There was also an advance of \$3 a ton on nuts except on semi-finished nuts, the price of which remain unchanged. Quotations on large structural and ship rivets and on large boiler rivets also remain the same as heretofore. There has been no change as yet in jobbers' prices. Although there has been a decline in contracting owing to the fact that many consumers closed for their third quarter, requirements before the advance, the demand continues good. The automobile industry is a particularly heavy purchaser. Among current inquiries from motor manufacturers is one for 5,000,000 nuts. Mill quotations for delivery in this territory are as follows:

Large structural and ship rivets.....\$3.70 base
Large boiler rivets.....\$3.80
1/4 in., 5/16 in. and 7/16 in. diam.....60-10-5 per cent off list
Machine bolts, hex. nuts, 3/4 in. x 4 in.
Smaller and shorter, rolled threads.....60-10 per cent off list
Cut threads.....50-10-10 per cent off list
Larger and longer sizes.....50-5 per cent off list
Machine bolts, c.p.c. and t. nuts, 3/4 in. x 4 in.:
Smaller and shorter.....45-10-5 per cent off list
Larger and longer.....40-10 per cent off list
Carriage bolts, 3/4 x 6 in.:
Smaller and shorter, rolled threads.....50-10-10 per cent off list
Cut threads.....50-10 per cent off list
Larger and longer sizes.....45-5 per cent off list
Lag bolts.....65 per cent off list
Plow bolts, Nos. 1, 2 and 3.....50-10-5 per cent off list
Hot pressed nuts, sq. blank.....3.10c. per lb. off list
Hot pressed nuts, hex. blank.....3.10c. per lb. off list
Hot pressed nuts, sq. tapped.....2.85c. per lb. off list
Hot pressed nuts, hex. tapped.....2.85c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....2.85c. per lb. off list
Semi-finished hex. nuts:
3/4 in. and larger.....70-10 per cent off list
9/16 in. and smaller.....80 per cent off list
Stove bolts in packages.....75-10-10 per cent off list
Stove bolts in bulk.....2 1/4 per cent extra
Tire bolts.....60-10-10 per cent off list
The above prices are from July 1, 1919.
All prices carry standard extras, Pittsburgh basis.

Cast Iron Pipe.—Springfield, Ill., has awarded 1,200 tons to the United States Cast Iron Pipe & Foundry Co. Current inquiries include the following:

Village of Lakewood, Ohio, 250 tons of 12-in., bids in July 14.
Minneapolis, Minn., 500 tons of 6-in., 8-in. and 12-in. Bids in July 17.
Sandusky, Ohio, 75 tons 6-in. and 8-in. Bids in July 18.
Denver, Col., 3070 tons 6-in. to 40-in., to be used on four different jobs. Bids in July 22.
Ashland, Ohio, 650 tons, 16-in. to 24-in. Bids to be in July 27.
Ashland, Ky., 150 tons. Bids in July 24.
Clarinda, Iowa, 212 tons 4-in. and 10-in. Bids in July 25.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$54.80; 6-in. and larger, \$51.80; class A and gas pipe, \$1 extra.

Old Material.—Purchases by consumers are small and infrequent. Dealers continue to bid up prices in connection with offerings of railroad and Government material. Little effort is made to induce consumers to buy, as the dealers are confident that further advances will take place, and in this belief are industriously building up their stocks. Railroad lists include 3000 tons each offered by the Grand Trunk and Burlington, 1200 tons offered by the Pere-Marquette,

and 1000 tons each offered by the Grand Trunk, the Chesapeake & Ohio and the Chicago & Alton. The Michigan Central has issued a blind list and the Monon, St. Paul & Omaha lists of 750, 500 and 200 tons, respectively.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$22.00 to \$23.00
Relaying rails	35.00 to 45.00
Carwheels	23.25 to 24.25
Steel rails, rerolling	23.50 to 24.00
Steel rails, less than 3 ft.	21.50 to 22.00
Heavy melting steel.....	18.50 to 19.50
Frogs, switches and guards cut apart.	18.50 to 19.50
Shoveling steel	18.50 to 19.00

Per Net Ton

Iron angles and splice bars.....	\$21.00 to \$22.00
Steel angle bars.....	18.00 to 18.50
Iron arch bars and transoms.....	23.50 to 24.50
Iron car axles.....	28.50 to 29.50
Steel car axles	26.50 to 27.00
No. 1 busheling.....	16.50 to 17.00
No. 2 busheling.....	12.00 to 12.50
Cut forge	17.00 to 17.50
Pipes and flues	14.25 to 14.75
No. 1 railroad wrought.....	17.50 to 18.50
No. 2 railroad wrought.....	17.00 to 17.50
Steel knuckles and couplers.....	18.00 to 18.50
Coil springs	20.50 to 21.00
No. 1 cast	22.00 to 23.00
Boiler punchings	20.00 to 20.50
Locomotive tires, smooth	20.00 to 20.50
Machine shop turnings	8.50 to 9.00
Cast borings	10.75 to 11.75
Stove plate and light cast.....	17.75 to 18.75
Grate bars	17.50 to 18.00
Brake shoes	16.50 to 17.50
Railroad malleable	18.00 to 19.00
Agricultural malleable	17.50 to 18.00
Country mixed	13.50 to 14.50

Daylight Saving Saved

WASHINGTON, July 15.—The House of Representatives, by a vote of 247 to 135, failed to override President Wilson's veto of the agricultural appropriation bill, with its rider to repeal the daylight savings law. The President's veto was a surprise, for it threatened to tie up the entire finances of the agricultural department. After the failure of the House to override the veto, however, it was announced that an amended bill, eliminating the rider, would be quickly passed by both houses. The fight over daylight saving is not ended, the House of Representatives having already passed a special repeal bill which is now pending in the Senate. The President, however, is certain to veto that measure, if it is again presented to him, and in the face of his opposition, it is doubtful whether the opponents of daylight saving can muster the necessary two-thirds vote to repeal that law.

Government Surplus Sales

The St. Louis District Salvage Board, Ordnance Department of the Army, is receiving bids until 11 a. m., July 17, on 1558 ingots, 382 gross tons, for forging 9.5 in. common steel shells. These ingots were purchased from the American Steel Foundries, East St. Louis, Ill.

The St. Louis District Salvage Board, Ordnance Department of the Army, offers for sale 1014 metal drums, 43 in. high by 28 1/2 in. in diameter, formerly used as phenol containers. The drums are in storage at the Monsanto Chemical Co., St. Louis, and are slightly rusted.

A new type of pipe union is announced by the Codd Tank and Specialty Co., 406 West Camden Street, Baltimore. In addition to the bronze seat in the main body this pipe union is equipped with a second bronze seat in the nut, thus to prevent leakage through the nut. The unions will be made with a heavy nut to suit the demands of railroads, shipbuilders, steam fitters and plumbers.

After being idle three months the Oak Street foundry of the United Engineering & Foundry Co., Youngstown, Ohio, resumed July 14, because of increased business.

EXPORT MARKET BROADENS

Inquiries from All Parts of the Globe

India Wants Cast Pipe, and Italy and France Plates—Export Plate Price Cuts

Export demand remains an outstanding feature of the iron and steel market. Inquiry is substantially worldwide and for a wide variety of products. Not very much has been closed in the last week, but in recent weeks the average bookings have probably totalled fully 10 per cent of the country's present production.

The healthy aspect is the large number of relatively small sales. These have included products also in demand for domestic account, such as sheets, pipe, bars, wire, hoops and bands. New inquiries include 17,000 tons of cast-iron pipe for India and 750 tons for Cuba. Italy seems likely early to buy 5000 tons of plates and 2300 to 4600 tons of plates are under negotiation for France. The bolts and nuts market is widening.

Purchases have been made for the Dutch East Indies of 100 tons of plates, one-half of them checkered and 900 locomotive tires, and at this writing settlement has probably been made on 200 tons of plates, 100 tons of sheets, 3000 tons of bars and 50 tons of bands. The Japanese shipbuilding tonnage has not yet been settled, nor has the railroad material for Spain, except some springs for bumpers and the like. A further lot of rails, about 150 tons, is wanted in Mexico. Latin-America is a good general buyer.

Early business is also expected in tin plate, on which the inquiries total several thousand tons. While America recently lost some tin plate business at \$6.40 a box, the foreign source of supply has raised the price to \$7. This is not taken to mean that American tin plates for export could not be obtained for less than \$7.

Some cut prices have been noted in plates for export. A price of 2.80c., New York, was named on 250 tons and 2.50c., Pittsburgh, on 500 tons.

A round tonnage of basic iron has been sold to England, but an inquiry of 20,000 tons appears still to be open. With higher coal prices in England higher pig iron as well as steel prices are expected and this may make it easier to sell American iron there in spite of the further drop in foreign exchange between England and the United States.

Machinery Export Business

From the American representative of Schneider et Cie., of France (the Creusot Works), New York machine-tool houses have received a list of 28 large tools; these being wanted for immediate delivery for shipment to France where, it is understood, they are wanted for a steam turbine plant.

Cincinnati, a center of the machine-tool industry, finds that orders from South America are on the increase. Among the machines shipped are several shaping machines. These did not go to railroad shops, and a South American importer advises a Cincinnati manufacturer that the war has stimulated light manufacturing in South America. Inquiry in increased volume is coming from Spain, also, while the Scandinavian countries are steady purchasers. Even Chicago has felt the foreign demand. An Easton, Pa., machinery manufacturer has been encouraged by its export business to extend its plant.

France May Build Ships in United States

Acting upon instructions from the French Government, the French High Commission, 65 Broadway, New York, has recently obtained from a number of American shipyards estimates of cost and data as to facilities preparatory to the placing of contracts in this

country for the construction of a large number of steel ships. It has been reported that as many as 200 ships would be contracted for, but it is stated at the French High Commission offices that nothing definite will be known here for some time.

Capt. Millot, an engineer of the commission, is now on his way to France with all of the bids. A cablegram announcing the decision of the French Government is not expected before next month. It is stated that the French Government prefers private companies to finance the construction of the ships, but if this cannot be arranged the Government will do the financing and building and the ships will probably be sold or leased to private operators.

If the program of 200 ships is carried out several hundred thousand tons of steel will be required, and this will be purchased from American mills.

Higher British Prices Likely

Advance in Coal Causes Shock—Tin Plate Higher—Lorraine Plants Offering Steel

(By Cable)

LONDON, ENGLAND, July 14.

An advance of 6s. in the price of coal has produced consternation and all steel prices must be revised. In the meantime, however, makers are generally refusing to quote. The steel output is suffering from strikes, reduced hours and malingering and the position grows worse. Prices are unquotable at present until coal problems are settled; where prices are named they are extremely irregular.

The demand for pig iron still exceeds the supply, but ore prices are weakening because of lower freights. American basic iron has been sold to Wales and Scotland.

Lorraine iron and steel plants are offering, through the French Government, the following products at the following prices: Thomas iron, 218 fr. (\$31, with francs at 7); foundry iron, 223 fr. (\$32); sheet bars, 423 fr. (\$60.45); billets and blooms, 393 fr. (\$56.15); slabs, 403 fr. (\$57.60); rails, 538 fr. (\$76.90); girders, tees, angles and bars, 513 fr. (\$73.30); all free on rail, Antwerp dock, in not less than 500-ton lots.

Tin plates are up to 34s. (\$7.48) f.o.b. Wales because of the coal situation. Japan is inquiring for 150,000 boxes of oil sizes. It is reported that British-American capital is interesting itself in the prospect of erecting tin plate mills in Mexico for supplying the oil trade. Galvanized sheets are quoted at about £28 (\$123.20) basis.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at \$4.40 for £1, with the reservation that most makers have temporarily withdrawn prices:

Pig iron:	£	s.	d.	£	s.	d.
East Coast hematite..10	0	0	to 10	5	0	\$44.00 to \$45.10
West Coast hematite.. 9	5	0	to 9	10	0	40.70 to 41.80
Cleveland No. 3 foundry	8	0	to 8	5	0	35.20 to 36.30
Cleveland basic	8	5	to 8	10	0	36.30 to 37.40
Ferromanganese	25	0	0			110.00
Billets	14	10	to 15	0	0	63.80 to 66.00
Tin plate and sheet bars.13	10	0				59.40
Rails, 60 lb. and upward	16	0	0			70.40
						Cents per lb.
Steel bars	19	15	0			3.87
Large rounds, etc....17	17	6				3.51
Structural material:						
Beams	17	0	0			3.33
Plates	17	15	0			3.48
Plates, boiler	20	0	0			3.92
Bar iron, stand. crown..21	0	0				4.12
Tin plates, 14 x 20, coke 1	14	0				\$7.48
112 sheets, 108 lb., f.o.b. Wales.						

The Hollingsworth Knife Co., Kane, Pa., manufacturer of cutlery, is extending its plant by a three-story addition, 40 x 100 ft., and is expected to purchase equipment.

The Pittsburgh District

The Pittsburgh District Salvage Board, in charge of George C. Hoisterman of the Ordnance Department, is offering considerable material for sale to consumers in that district. One lot of 7,000,000-lb. of shell steel in 3-ft. to 10-ft. lengths, in storage at Neville Island, Pittsburgh, is offered and bids are to be opened on Friday, July 18. Another lot of 9,500,000-lb. of shell steel in 3 to 10-ft lengths, stored at the plant of the Pressed Steel Car Co., is also offered, bids to be opened July 19. Another lot of 10,752,540-lb., part in 18-in. to 20-in. and the remainder in 3 to 10-in. lengths, also stored at the plant of the Pressed Steel Car Co., is included in the offers, bids to be opened July 19. A further lot of 7,000,000-lb. of shell steel in 3 to 10-ft. lengths, stored on Neville Island, also 681,240-lb., more or less, of shell forgings 4-ft. 7 in. in length, stored at Neville Island, and 124 tons of low phosphorus pig iron at the plant of the Edgewater Steel Co., Oakmont, Pa., are to be sold, bids for all this material to be opened July 18. All material must be removed within 30 days, and awards are to be made within 72 hours after the opening of bids. The Government reserves the right to reject any and all bids.

The Pittsburgh office of the National Trading Co., dealer in iron and steel, coal and coke and old material, is now located in room 516 Oliver Building, Pittsburgh. H. O. Price is general sales manager of the Pittsburgh office.

The Independent Bridge Co., Pittsburgh, has filed complaint against the United States Railroad Administration, the Pittsburgh & Lake Erie and Baltimore & Ohio railroads, alleging discrimination in freight charges and asking return of alleged over-charges.

The monthly meeting of the Association of Tin Plate Manufacturers, comprising the independent tin plate mills, will be held in the William Penn Hotel, Pittsburgh, on Friday, July 18. George D. McIlvain, Oliver Building, Pittsburgh, is secretary.

There seems to be some confusion as to the puddling rate for July and August, fixed at the recent conference between committees of the Amalgamated Association and the bar iron manufacturers. The rate for puddling is \$12.38 per gross ton for this month and August. This rate is arrived at by taking the average price on iron bars for May and June, which was found to be 2.50c. at mill. Under the terms of the old scale, that expired June 30, the rate for puddling on the 2.50c. card was \$12.05. However, under the terms of the scale settlement, the men were given an advance of 5 per cent on the rate for puddling for a 1.30c. card, which was \$6.50 per ton. This entitles the men to an advance for July and August of 32½c. per ton, but they were given the advantage in these two months of the ½c., so that the advance they receive for this and next month is 33c., which, added to \$12.05, the rate on the 2.50c. card, makes the puddling rate for July and August \$12.38 per gross ton.

The Weirton Steel Co., which some time ago completed the erection of a new blast furnace at Weirton, West Va., with a capacity of 550 to 600 tons of pig iron per day, expects to blow this furnace in during next week. The output will be sold in the open market. As noted on page 1462 of THE IRON AGE of May 29, the Weirton Steel Co. has started to build an open-hearth steel plant at Weirton, which will contain seven 100-ton furnaces. Contracts for practically all the equipment have been placed, and work on the new plant is now going on rapidly. Last week the Weirton Steel Co. placed a contract with the General Electric Co. for a power plant, turbine engines, motor generator and switch boards, while the Westinghouse Electric & Mfg. Co. was given a contract for the motors for the blooming and finishing mills.

The Republic Iron & Steel Co., Youngstown, Ohio, has practically decided to add 30 hot sheet mills to its DeForest works at Niles, Ohio, which it bought some time ago from the DeForest Sheet & Tin Plate Co.

Contracts for these 30 new mills, and other equipment, will likely be placed in the near future.

The Westinghouse Air Brake Home Building Co., an interest of the Westinghouse Air Brake Co., Wilmerding, Pa., has bought 8½ acres of ground in Swissvale, near its plant, on which the building company will erect homes for employees of the Westinghouse interests.

Owing to the increased demand for sheet bars, the Carnegie Steel Co., Pittsburgh, is making plans to start its Columbus Steel Works at Columbus, Ohio, on sheet bars as soon as it can be made ready. This plant has been idle since late last year.

IRON AND INDUSTRIAL STOCKS

Industrials Reach New High 1919 Level—Crucible and Bethlehem at Record Levels

NEW YORK, July 14.

The market as a whole reached new high levels the past week, thirty representative industrial shares showing a 32-point average advance, up to and including Saturday, from the low level early in the year. Speculation has been at a high pitch, and public participation is strong. Call money reached 20 per cent on Monday week and held high for several days, but did not act as a damper on buying. Early this week call money was fairly normal, but speculation continued very heavy, particularly in Crucible and Bethlehem "B" steel shares, the former reaching a record figure of 149. The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com. 47 - 49½	Int. Har. pf. 119½ - —
Allis-Chalm. pf. 91 - 96	La Belle Ir. com. 115 - 117½
Am. Can. com. 59½ - 62½	Lackaw. Steel .. 86 - 93½
Am. Can. pf. 105 - 105½	Lake Sup. Corp. 20½ - 23½
Am. C. & Fdy. cm. 110½ - 115½	Midvale Steel .. 58½ - 62½
Am. C. & Fdy. pf. 118 - 119	Nat.-Acme 38½ - 43½
Am. Loco. com. 90 - 97½	Nat. E. & St. cm. 80 - 86½
Am. Loco. pf. - 107	Nat. E. & St. pf. 102 - —
Am. Radiator cm. 315 - —	N. Y. Air Brake. 125 - 128
Am. Radiator pf. 116 - —	Nova Scotia Steel 83 - 90½
Am. Ship com. 126 - 134½	Penn-Seaboard .. 41 - 55
Am. Ship pf. 90 - —	Pittsb. Steel pf. 96½ - 97
Am. Stl. Fdries. 44½ - 47	Pressed Stl. com. 88 - 93½
Bald. Loco. com. 110½ - 124½	Pressed Steel pf. 104 - 104½
Bald. Loco. pf. 107½ - —	Ry. Stl. Sog. com. 94½ - 99
Beth. Steel com. 94½ - 107	Ry. Stl. Spg. pf. 108½ - 109
Beth. Stl. Cl. B. 94½ - 110½	Republic com. .. 96 - 103½
Cent. Fdry. com. 29 - 37½	Republic pf. 103½ - 104½
Cent. Fdry. pf. 63½ - 68½	Sloss, com. 71 - 75½
Chic. Pneu. Tool 79½ - 81	Sloss pf. 94½ - —
Colo. Fuel 51½ - 56	Superior Steel .. 46 - 49½
Cru. Steel com. 115 - 149	Transue-Williams 55½ - 59
Cru. Steel pf. 103 - 105	Un. Alloy Steel. 54½ - 56½
Deere & Co. pf. 101½ - —	U. S. Pipe com. 34 - 36
Gen. Electric. 168 - 173½	U. S. Pipe pf. 72½ - 74
Gt. No. Ore. Cert. 50 - 50½	U. S. Steel com. 111½ - 115½
Gulf St. Steel. 69½ - 71½	U. S. Steel pf. 116½ - 116½
Int. Har. com. 144½ - 147½	Va. I. C. & Coke 68 - 69
	Westingh. Elec. 57½ - 59½

Dividends

Harbison-Walker Refractories Co., quarterly, 1½ per cent on the preferred, payable July 19.
American Road Machinery Co., quarterly, 1% on preferred, payable Aug. 15.
Emerson-Brantingham Co., quarterly, 1% on preferred, payable Aug. 1.
Ingersoll-Rand Co., quarterly, 2½ on common, payable July 31.
International Nickel Co., quarterly, 1½ on preferred, payable Aug. 1.
Pittsburgh Steel Co., quarterly, 1% on preferred, payable Sept. 1.

Recently announced figures for June 30, show a reduction in the foreign holdings of United States Steel Corporation shares. They show 465,434 common and 146,478 preferred shares held in foreign countries. The March 31 figures were 493,552 common and 149,832 preferred. The greatest decline in foreign holdings has been in Holland, still the largest holder of steel stock, although holdings have dwindled from 356,945 shares common before the war to 210,525 on June 30. With the foreign decline, there has been a reduction of investment holdings and increase of brokerage holdings in this country.

STEEL WORKS LABOR COST

Common Labor's Rate Per Hour Trebled in Less Than Nine Years

In the accompanying table is recorded the wage in cents per hour paid to common labor in the Calumet District, adjacent to Chicago, since January, 1904. The figures were obtained from the records of the Inland Steel Co., but they are representative of what all employers have paid in the great industrial district in which the main plant of the Inland Steel Co. is located, as well as those of many other larger employers in the iron, steel and metal-working lines.

The figures up to Oct. 1, 1918, represent the actual rate per hour, but on that day the 8-hr. basic day became effective and the figures given for the time thereafter take account of the fact that while a man worked 10 hr. he was paid for 11 hr. The actual average, based on 42c. per day, is 46.2c., but in this case 46.5c. is given, that being the Inland company rate.

In the table, wage changes are emphasized by a

57 per cent for fuel, heat and light, and 55 per cent for sundries. As related to the total budget the percentage increase in the cost of living was found to be 61.3. It will be seen, therefore, that the wage increase of 137 per cent for steel works labor between 1914 (the wage being unchanged in that year) and October, 1918, as shown by the accompanying table from the records of the Inland Steel Co., was far more than the increase in the cost of living in the same period.

Reduced Production of Coke and Coal

WASHINGTON, July 15.—Bituminous coal production in the United States is running 500,000 tons less per day than a year ago, while beehive coke production was less than half the 1918 figure during the first week in July, according to the figures of the Geological Survey.

The production of bituminous coal in the week ended July 5 is estimated by the Survey at 7,469,000 net tons, an average per day for the five working days of 1,494,000 tons compared with an average per day of 1,576,000 tons in the previous week, as against 2,050,000 tons in the week ended July 6, 1918. The produc-

RATE PER HOUR FOR COMMON LABOR. FIGURES ARE FROM THE RECORDS OF THE INLAND STEEL CO. AND GENERALLY APPLICABLE TO CALUMET DISTRICT
(Cents per Hr.)

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
January....	15	15	13½	13½	15	15	16	17	17	17	19½	19½	19½	27½	33	46½
February...	15	15	13½	13½	15	15	16	17	17	19½	19½	19½	22	27½	33	46½
March.....	15	15	13½	13½	15	15	16	17	17	19½	19½	19½	22	27½	33	46½
April.....	15	13½	13½	15	15	15	16	17	17	19½	19½	19½	22	27½	35½	46½
May.....	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	30	38	46½
June.....	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	30	38	46½
July.....	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	30	38	....
August....	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	30	42	....
September..	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	30	42	....
October....	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	33	46½	....
November...	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	25	33	46½	....
December..	15	13½	13½	15	15	15	17	17	17	19½	19½	19½	26½	33	46½	....

heavy line. All have been advances with one exception, a reduction having been made on April 1, 1905. Between January, 1916, and October, 1918, there were 10 advances, from 19½c. to 46.5c., reached in the latter month and year. At the end of 1909 the rate per hour was 15c., or about one-third that paid to-day.

Following are yearly averages, from 1914 on, of the *Annalist* index number which is designed to show the fluctuations in the average wholesale prices of 25 food commodities selected and arranged to represent a theoretical family's budget:

1919 (year to date).....	300,000
1918.....	287,080
1917.....	261,796
1916.....	175,720
1915.....	148,055
1914.....	146,069

Weekly averages for the first week in July in 1919, 1918 and 1917 were as follows:

July 5, 1919.....	301,085
July 6, 1918.....	281,217
July 7, 1917.....	264,789

In the statistics representing the investigations of the National Industrial Conference Board, 15 Beacon Street, Boston, food is reckoned as 43.1 per cent of the family budget; shelter, 17.7 per cent; clothing, 13.2 per cent; fuel, heat and light, 5.6 per cent, and sundries 20.4 per cent. The increase in cost of living between July, 1914, and March, 1919, as computed by the National Industrial Conference Board for wage earners in average American communities, was 75 per cent for food, 22 per cent for shelter, 81 per cent for clothing,

tion for the calendar year to date was 220,361,000 tons, nearly 74,500,000 tons less than in the corresponding period last year. The average daily production, considering only working days, has been 500,000 tons less this year than last year.

The production of beehive coke in the week ended July 5 is estimated at 262,410 net tons, compared with 579,000 tons in the week ended July 6, 1918, and with 283,600 tons in the last week of June, 1918. The production in the week ended July 5 was curtailed because of the celebration of the holiday on July 4.

Orders for Greaves-Etchells Furnaces

The Electric Furnace Construction Co., Philadelphia, reports the receipt of the following orders for Greaves-Etchells electric furnaces: Sullivan Machinery Co., Claremont, N. H., a one-ton furnace, and the Imperial Japanese Mint, Osaka, Japan, a furnace for the manufacture of coinage bronze.

On June 28 Governor Lowden of Illinois signed a bill authorizing the city of Chicago to issue bonds for the erection of a large convention hall. The plans have not yet been drawn, but the structure will undoubtedly be one of the largest in the country.

The Aluminum Bronze Bearing Co. of Buffalo, has purchased a site in Youngstown, Ohio, and will erect a large foundry. The company manufactures heavy mill bearings.

Larger Steel Ingot Output

The ingot production in June of steel works in the United States amounted to 2,640,984 gross tons or 105,639 tons a day for 25 days, as compared with 85,024 tons a day during May, a gain of over 24 per cent in daily output. This monthly total is equivalent to about 32,642,500 gross tons annually, based on 309 working days and on reports to the American Iron and Steel Institute from 30 companies which made 84.03 per cent of the total amount in 1918. For the first half of 1919 the steel ingot production is estimated at 17,687,350 gross tons as compared with 20,120,000 tons in the first six months of 1918.

The table below gives the tonnage of steel ingots produced in 1918 by 29 companies making in 1917 about 85.10 per cent of the entire amount, and for the past five months figures from 30 companies making 84.03 per cent of the production in 1918:

Monthly Production of Steel Ingots of Companies Reporting—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1918 ..	1,763,356	429,588	10,901	2,203,845
February	1,805,233	454,457	14,051	2,273,741
March	2,331,048	763,255	16,078	3,110,381
April	2,377,974	769,249	16,187	3,163,410
May	2,475,131	796,244	15,858	3,287,233
June	2,281,718	786,380	15,348	3,083,446
July	2,311,545	784,997	17,093	3,113,635
August	2,299,177	766,860	17,643	3,083,680
September	2,407,993	772,863	16,802	3,197,658
October	2,527,776	807,043	17,377	3,352,196
November	2,291,720	753,409	15,631	3,060,760
December	2,273,189	706,844	12,273	2,992,306
Total, 1918 ..	27,145,860	8,591,189	185,242	35,922,291
January, 1919 ..	2,351,153	749,346	7,279	3,107,778
February	2,043,635	655,206	5,842	2,704,683
March	2,100,528	555,332	6,405	2,662,265
April	1,732,447	500,770	6,494	2,239,711
May	1,506,015	414,392	8,617	1,929,024
June	1,692,257	521,634	5,328	2,219,219
6 mos.	11,426,035	3,396,630	39,965	14,862,630

Country's Estimated Production in 1919

The monthly production for the entire country, estimated from the tonnage reports of the 30 companies which made 84.03 per cent of the total output for 1918, is as follows:

January, 1919.....	3,698,415	April	2,665,371
February	3,218,711	May	2,295,637
March	3,168,232	June	2,640,984
6 months			17,687,350

Heavy Demand for Pipe and Wire in Youngstown District

Youngstown, Ohio, July 15.—Pipe and wire demands continue to dominate the local market, although there is a growing demand for sheet plates, bars, shafting and semi-finished material. There is no let-up in the business from the oil country, specifications for lapweld pipe exceeding mill capacity. Several makers are sold ahead for two to three months, with bookings still coming in. Tube mills are operating on double turn in most cases. Butt-weld orders are being received in more encouraging volume. Shipments of lapweld are being made to Texas and Mexico. Activity in the oil fields is producing a better tone in the plate market, and fabricators are getting substantial orders for tank plates.

Semi-finished material is being shipped in heavy volume each day, including consignments of bars, billets, slabs and blooms. Plate bookings are improving and one maker is reported to have made record post-war shipments last month. The Standard Oil Co. is in the market for a medium-sized tonnage.

Sheet makers continue to get orders from the automotive industry, and one maker will not promise deliveries under eight weeks on certain grades. Prices are constantly becoming firmer and still further advances are looked for by producers. Inquiries have come into the market from the General Motors Corporation, a Canadian manufacturer and from Japan.

Tight schedules maintained by tin plate makers

reveal a heavy volume of business, with no deliveries promised under ten weeks.

The implement trade is in the market for shapes and bookings for bars and billets have come from this source in the past week.

Foundry iron is moving in good quantities.

Prices for scrap iron and steel are becoming firmer. Dealers are asking \$21 a ton for crop ends, billet and bloom croppings.

A. M. Byers Co. Signs Amalgamated Scale and Strike Ends

The strike of employees at the puddle mills of the A. M. Byers Co. plant at Girard, Ohio, ended Saturday, July 12, when officials of the company at Pittsburgh agreed to recognize affiliation of the employees with the Amalgamated Association of Iron, Steel and Tin Workers and sign the Amalgamated wage scale. Heretofore the company has always adopted a scale equal to that of the Amalgamated, but refused to recognize the union. A committee of employees waited on the management at Pittsburgh. The men were out two weeks.

The company has started its 29 puddling furnaces at its South Side works in Pittsburgh, and also its 88 single puddling furnaces at Girard, Ohio, and will pay the regular Amalgamated Association scale for puddling for July and August, which is \$12.38 per gross ton. The entire output of its 117 puddling furnaces is used in making wrought iron pipe. Its Mattie furnace, which has been idle for some time for relining and repairs, has again gone in blast on forge iron, which is used in the company's puddling furnaces at Girard and Pittsburgh.

Steel Corporation Orders Increase in June

Unfilled orders on the books of the United States Steel Corporation, June 30, were 4,892,855 tons, compared with 4,282,130 tons on May 31. This is an increase of 610,545 tons, and is the first one since last October, the decreases each month since then having averaged about 600,000 tons per month. The unfilled orders a year ago, June 30, were 8,918,866 tons. The table below gives the unfilled tonnage for the Steel Corporation at the close of each month beginning with January, 1916:

	1919	1918	1917	1916
January	6,684,263	9,477,853	11,474,054	7,922,767
February	6,010,787	9,288,453	11,576,697	8,568,966
March	5,430,572	9,056,404	11,711,644	9,331,001
April	4,800,685	8,741,882	12,183,083	9,329,551
May	4,282,310	8,337,623	11,886,591	9,937,798
June	4,892,855	8,918,866	11,383,287	9,640,458
July		8,883,801	10,844,164	9,593,592
August		8,759,042	10,407,049	9,660,357
September		8,297,905	9,833,477	9,522,584
October		8,353,293	9,009,675	10,015,260
November		8,124,663	8,897,106	11,058,542
December		7,379,152	9,381,718	11,547,286

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons; the lowest was on Dec. 31, 1910, when the total was 2,605,747 tons.

Car Company's New Plant

YOUNGSTOWN, OHIO, July 15.—Contracts were let to-day by the Youngstown Steel Car Co. for a new plant at Niles, Trumbull County, Ohio, involving \$700,000. The company has a 185-acre site. The main building will be 200 x 400 ft.

The Bridgeport Chain Co., Bridgeport, Conn., makes the following announcement: "The heavy increase in freight rates and changes in classification on practically every item which we make compel us to revise our maximum freight allowance. Therefore, until further notice the following will govern: Actual freight allowed up to 25c. per 100 lb. on any one shipment of not less than 300 lb. This does not include the war tax on transportation. To competitive points, we will equalize with the Cleveland freight rate."

Non-Ferrous Metals

The Week's Prices

Cents per Pound for Early Delivery.							
Copper, New York		Tin, New York		Lead New York		Spelter New York	
July	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
9.....	20.25	20.00	70.00	5.45	5.20	7.55	7.20
10.....	20.50	20.25	70.00	5.45	5.20	7.60	7.25
11.....	20.75	20.50	70.00	5.45	5.20	7.70	7.35
12.....	21.00	20.75	....	5.45	5.20	7.80	7.45
14.....	21.50	21.25	70.00	5.50	5.25	7.90	7.55
15.....	22.00	21.75	70.00	5.50	5.25	8.00	7.65

NEW YORK, July 15.

Pronounced strength and activity characterize practically all the markets except possibly tin. Demand for copper is increasing and quotations are advancing rapidly. The tin market continues to be quiet. Demand for lead is better and prices have been advanced. Prices for zinc (spelter) are considerably higher on heavy demand. Antimony is nominally unchanged.

New York

Copper.—The fact, which developed last week, that Government supplies of copper have been sold and also the realization that trading with the Central Powers is now possible, has caused a marked change in the copper market. Coupled with this is also the increasing domestic demand. Some producers are entirely out of the market for July and August delivery, and it is not at all improbable that metal for these positions may be scarce very soon, if it is not already so. Those producers who are out of the market temporarily are now asking not less than 22c., New York, for electrolytic copper for September delivery and will quote on no position beyond September. So rapidly are conditions changing that it is difficult to appraise the value of the market for early delivery. Judged by its present condition electrolytic copper for July-August delivery is quoted at 21.75c., New York, with the probability that it will advance almost daily. Stocks are being rapidly depleted and the labor situation is none too encouraging as to the possibility of increasing the present rate of production, which is low. Japan continues an important buyer, but very little has thus far been heard of any definite inquiries from the Central Powers, whose needs are known to be insistent. Lake copper is quoted at 22c. to 22.25c., New York, for July-August delivery, for which position it is none too plentiful.

Tin.—As compared with the other markets, unusual quietness has prevailed in the tin market the entire week. Very little buying has been reported for any position and relatively there has been more demand for retail lots than for wholesale. This comes from those consumers who did not take much of the allocated metal. It is interesting to state that those large users who absorbed most of the allocated tin are now reluctant to resell this even if, by so doing and buying future tin, a substantial profit would accrue. Such tin which is available is quoted at 70c., New York, for spot delivery. Straits tin for shipment from the East is quoted at 51c. and the same grade of tin from England at 52.25c. American tin, 99 per cent pure, is unchanged at 67c. to 68c., New York.

Lead.—The advance in lead, which has been expected for some time, took place on Monday, July 14, when the American Smelting & Refining Co. advanced its price from 5.40c. to 5.50c., New York, or 5.15c. to 5.25c., St. Louis. There has been a moderate demand all the week, but it has not been brisk. To-day, however, some sellers report a brisk demand with sales made in a few cases as high as 5.65c., New York, all by outside interests. Future lead in the last week has sold at least \$2 per ton over the prompt quotation. We quote

the market at 5.25c., St. Louis, or 5.50c., New York, for wholesale lots for early delivery.

Zinc (Spelter).—In the last week a distinct change has come over the zinc market and to-day it is stronger than in many weeks. Increased buying by both galvanizers and brass manufacturers, as well as a considerable demand from Japan and other foreign sources, has gradually caused prices to advance almost daily until Prime Western for July-August delivery is to-day quoted at 7.65c., St. Louis, or 8c., New York, with September delivery not less than 7.75c., St. Louis, or 8.10c., New York. Some interests even report the metal scarce. Some of the strength of the present position of the metal is due also to the higher prices obtained for ores in the St. Louis district.

Antimony.—Prices are unchanged at 8.37½c to 8.50c., New York, duty paid, for wholesale lots for early delivery.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery is quoted at 32c. to 33c., New York.

Old Metals.—The market is firm and advancing. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	20.00
Copper, heavy and wire	18.50
Copper, light and bottoms	15.50
Brass, heavy	14.00
Brass, light	9.50
Heavy machine composition	18.25
No. 1 yellow rod brass turnings	11.50
No. 1 red brass or composition turnings	15.00
Lead, heavy	5.00
Lead, tea	4.25
Zinc	5.00

Chicago

CHICAGO, July 15.—Copper is strong and has advanced. Although the demand is not general, considerable business has been done in spots. There has been no change in the tin situation. Although the lead market is not very active, stocks are held firmly and prices have advanced one-tenth of a cent. The price of spelter has increased as the result of an expanding export demand. Antimony is dormant. In old metals the various grades of copper and brass have advanced and tin has declined. We quote copper at 22c. for carloads; tin, 70c. to 72.50c.; lead, 5.35c. to 5.45c.; spelter, 7.50c. to 7.63c.; antimony, 9.50c. to 10c. On old metals we quote copper wire, crucible shapes, 16.25c.; copper clips, 16c.; copper bottoms, 14c.; red brass, 16.25c.; yellow brass, 10.50c.; lead pipe, 4c.; zinc, 4c.; pewter, No. 1, 35c.; tinfoil, 37c., and block tin, 45c., all these being buying prices for less than carload lots.

St. Louis

ST. LOUIS, July 15.—Non-ferrous markets have been better in tone, lead in car lots closing at 5.22½c. and firm and spelter at 7.50c. and strong. In less than car lots the quotations have been: Lead, 5.75c.; spelter, 8c. to 8.25c.; tin, nominal; copper, 18.50c.; antimony, 9c. In the Joplin district ore was in better demand with the result that lead ore prices, basis 80 per cent, were pegged at \$62.50 per ton, while the average for the district for the week was \$62 per ton. Zinc blende of high grade brought \$50 per ton, with other grades selling at \$45. Prices are very strong and advancing. Calamine, basis 40 per cent, ranged from \$25 to \$28 per ton with the overage at \$27 per ton for the district. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7c.; heavy yellow brass, 9.50c.; heavy red brass, 13.50c.; heavy copper and copper wire, 13.50c.; light copper, 11.50c.; pewter, 35c.; tinfoil, 44c.; lead, 4c.; tea lead, 3c.; zinc, 3.50c.; aluminum, 18c.

Bethlehem, Pa., Chamber of Commerce has issued announcement that a branch of the Standard Plumbing Supply Co., New York, will be located in Bethlehem.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

The prices below are based on those announced at Washington by the Industrial Board on March 20, 1919, effective the following day, which since that date have largely governed market transactions, though there have been variations, as indicated in market reports on other pages.

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and Zees, structural sizes, 2.45c.

Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50, and shorter than 1 in., \$2.00. Bright basic wire, \$3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.00; galvanized wire, \$3.70; galvanized barbed wire and fence staples, \$4.10; painted barbed wire, \$3.40; polished fence staples, \$3.40; cement-coated nails, \$2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$3.70 base
Large boiler rivets.....\$3.80
¼ in., 5/16 in. and 7/16 in. diam., .65-10 and 5 per cent off list
Machine bolts, h.p. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads......60-10-5 per cent off list
Cut threads......60-5 per cent off list
Larger and longer sizes......50-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:
Smaller and shorter......45-10-10 per cent off list
Larger and longer......40-10-5 per cent off list
Carriage bolts, ¾ x 6 in.:
Smaller and shorter, rolled threads......60-5 per cent off list
Cut threads......50-10-5 per cent off list
Larger and longer sizes......45-10 per cent off list
Lag bolts......65-5 per cent off list
Plow bolts, Nos. 1, 2, 3......60 per cent off list
Hot pressed nuts, sq. blank......3.25c. per lb. off list
Hot pressed nuts, hex. blank......3.25c. per lb. off list
Hot pressed nuts, sq. tapped......3c. per lb. off list
Hot pressed nuts, hex. tapped......3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank......3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped......3c. per lb. off list
Semi-finished hex. nuts:
¾ in. and larger......70-10 per cent off list
9/16 in. and smaller......80 per cent off list
Stove bolts, in packages......75-10-10-5 per cent off list
Stove bolts, in bulk......2½ per cent extra
Tire bolts......60-10-10-5 per cent off list
The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52; chain rods, \$60; screw, rivet and bolt rods and other rods of that character, \$60. Prices on high carbon rods are irregular. They range from \$65 to \$75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., \$3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, \$4.35 per 100 lb. in carload lots of 200 kegs or more, and \$4.90 in small lots. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$13.50 per package; 8-lb. coating, I.C., \$14.10; 12-lb. coating, I.C., \$15.80; 15-lb. coating, I.C., \$16.80; 20-lb. coating, I.C., \$18.05; 25-lb. coating, I.C., \$19.30; 30-lb. coating, I.C., \$20.30; 35-lb. coating, I.C., \$21.30; 40-lb. coating, I.C., \$22.50 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

But Weld			
Steel		Iron	
Inches	Black Galv.	Inches	Black Galv.
½, ¾ and 1.....	50½ 24	1½ and 2.....	29½ 2½
1½.....	54½ 40	2½.....	30½ 3½
2 to 3.....	57½ 44	3 to 1½.....	34½ 16½
Lap Weld			
2.....	50½ 38	1½.....	24½ 9½
2½ to 6.....	53½ 41	1½.....	31½ 17½
7 to 12.....	50½ 37	2.....	32½ 18½
13 and 14.....	41 ..	2½ to 6.....	34½ 21½
15.....	38½ ..	7 to 12.....	31½ 18½
Butt Weld, extra strong, plain ends			
½, ¾ and 1.....	46½ 29	1½ and 2.....	28½ 11½
1½.....	51½ 39	2.....	33½ 20½
2 to 1½.....	55½ 43	2½ to 1½.....	39½ 24½
2 to 3.....	56½ 44	Lap Weld, extra strong, plain ends	
2.....	48½ 37	1½.....	25½ 10½
2½ to 4.....	51½ 40	1½.....	31½ 17½
4½ to 6.....	50½ 39	2.....	33½ 20½
7 to 8.....	46½ 33	2½ to 4.....	35½ 23½
9 to 12.....	41½ 28	4½ to 6.....	34½ 22½
To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.			

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		Charcoal Iron	
3½ to 4½ in.....	40½	3½ to 4½ in.....	—16
2½ to 3½ in.....	30½	3 to 3½ in.....	—1½
2½ in.....	24	2½ to 2¾ in.....	+1
1¾ to 2 in.....	19½	2 to 2½ in.....	+10
		1¾ to 1½ in.....	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in.....\$327	1½ in.....\$267
1¼ in.....267	2 to 2½ in.....177
1½ in.....257	2½ to 3 in.....167
1¾ in.....207	4 in.....187
	4½ to 5 in.....207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier.....	3.50
Nos. 9 and 10 (base).....	3.55
Nos. 11 and 12.....	3.60
Nos. 13 and 14.....	3.65
Nos. 15 and 16.....	3.75

Box Annealed, Ore Pass Cold Rolled—Bessemer

Nos. 17 to 21.....	4.15
Nos. 22 to 24.....	4.20
Nos. 25 and 26.....	4.25
No. 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.45
No. 30.....	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11.....	4.70
Nos. 12 and 14.....	4.80
Nos. 15 and 16.....	4.95
Nos. 17 to 21.....	5.10
Nos. 22 to 24.....	5.25
Nos. 25 and 26.....	5.40
No. 27.....	5.55
No. 28 (base).....	5.70
No. 29.....	5.95
No. 30.....	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16.....	4.15
Nos. 17 to 21.....	4.20
Nos. 22 to 24.....	4.25
Nos. 25 to 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.40
No. 30.....	4.40
Nos. 30½ and 31.....	4.45

PERSONAL

D. C. Schultz, Sr., whose work for many years has been in crane design and selling, has assumed the duties of sales manager of the Pittsburgh Crane & Equipment Co., Sharpsburg, Pa.

Edward Law, son of the late Ernest Law, was admitted on July 1, as partner to the firm of Ernest Law & Co., iron and steel merchants, Philadelphia.

J. H. Van Campen, steel plant engineer, the Timken Roller Bearing Co., Canton, Ohio, has resigned, and is now connected with the Midvale Steel & Ordnance Co., Coatesville, Pa.

Mark R. Lamb, with offices in the Woolworth Building, has secured a considerable interest in the New York Steel Exchange, Inc., and has combined with it his export business.

Frank R. Colville, formerly sales manager, Renokaetker Electric Co., Cincinnati, has joined the sales force of Eaton, Rhodes & Co., pig iron and coke merchants. He will travel out of the Cincinnati office.

William Lewis, formerly superintendent, the sheet mill plant of the old Western Reserve Steel Co., later acquired by the Brier Hill Steel Co., has been appointed to take charge of operations for the Falcon Steel Co., building a plant at Niles, Ohio.

H. M. Steele, formerly vice-president and general manager, the Liberty Steel Co., will be the operating manager for the Newton Steel Co., which will erect a sheet plant at Newton Falls, Ohio.

Capt. Henry A. Butler, formerly in charge of the cost department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, sailed July 10 from France, where he has served the American Red Cross since last fall. He will spend the summer with his family along the Maine coast, resuming his duties with the Sheet & Tube company in September.

E. J. Good, assistant purchasing agent of the American Steel Export Co., of New York, has left to make an investigation of conditions in China.

The Chicago Pneumatic Tool Co. announces several changes in its force. L. C. Sprague, district manager of sales, New York, has been made manager of Western railroad sales, Fisher Building, Chicago, being succeeded in New York by Nelson B. Gatch, formerly manager of sales in Chicago. H. G. Barbee has been appointed manager of Eastern railroad sales at 52 Vanderbilt Avenue, New York.

Ernst Mentor, technical supervisor C. E. Johansson, Inc., New York, gaging tools, has left for Sweden to remain until September on business. Upon his return he will make a lecturing tour among the technical schools of the country, discoursing on the use of gaging tools.

Prof. John Thomas, of Princeton University, mathematics department, has consented to give a course in advanced mathematics, including trigonometry, before the advanced students of the American Society of Mechanical Inspectors in their course, starting Sept. 15.

E. O. Johansson, originator of the gaging tools which bear his name, was elected honorary president of the American Society of Mechanical Inspectors at their meeting last Thursday.

Charles L. Fitz, formerly general superintendent Bleadon-Dun Co., Chicago, has accepted the position of works manager of the National Drop Head Projector Co., Fond du Lac, Wis., which is completing a new plant equipped for the manufacture of portable motion picture machines.

Dr. Edgar Kidwell, M. E., formerly Pacific coast manager Babcock & Wilcox Co., New York, has been elected general manager of the Kidwell Boiler & Engineering Co., organized at Milwaukee, Wis., with a capital stock of \$1,000,000 to manufacture high-pressure water-tube boilers of his own design. Dr. Kidwell is a graduate of Georgetown University, and for

eight years was professor of mechanical engineering, Michigan School of Mines, Houghton, resigning to become superintendent of the Arcadian Copper Co. John F. Jackson, formerly vice-president Wisconsin Bridge & Iron Co., Milwaukee, is president of the new corporation.

George W. Way, formerly connected with the Detroit offices of the Carnegie Steel Co., Pittsburgh, has been appointed Michigan representative of the Erie Crucible Steel Co., Erie, Pa., with offices at 858 Penobscot Building, Detroit.

Thomas P. Davis has been appointed chief engineer of the Duquesne Steel Works of the Carnegie Steel Co., Duquesne, Pa., to succeed William Ahlen, who resigned recently to return to his home in Sweden.

Albert Cummins has been appointed electrical engineer of the Duquesne works of the Carnegie Steel Co. to succeed Carl Cedarlund, who resigned recently to become electrical engineer of the General Electric Co. of Sweden.

John W. Watson Jr. has been made assistant manager of the Canonsburg Steel & Iron Works, Canonsburg, Pa.

Joseph A. Rogers is now connected with the sales department of A. C. Daft, Oliver Building, Pittsburgh, dealer in alloys and high grade ores.

M. L. Fellmer, St. Louis, has been appointed secretary of the Central Mississippi Valley division of the National Safety Council to succeed Carl L. Smith, who resigned recently to become public safety field secretary. Mr. Fellmer for a number of years has been in charge of accident prevention activities of insurance interests.

Albert C. Mann, formerly purchasing agent of the Illinois Central Railroad, has been appointed vice-president in charge of purchases for the American International Steel Corporation, New York.

W. O. Hickok, 3d, president, and Ross A. Hickok, secretary-treasurer, of the W. O. Hickok Mfg. Co., Harrisburg, Pa., were presented a loving cup recently by employees in celebration of the seventy-fifth anniversary of the establishment of the company by their grandfather, W. O. Hickok.

F. V. Larkin, connected with the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., since the summer of 1915 in charge of inspection of war orders, has resigned to become professor and head of the department of mechanical engineering, Lehigh University, Bethlehem, Pa. He had been connected with that institution before entering the service of the Harrisburg company.

Randolph Owens, who for ten years has been connected with the St. Louis office of the American Sheet & Tin Plate Co., has been transferred to the Philadelphia office of the company.

Carl W. Gage has been transferred from the St. Louis office to the New York office of the Jones & Laughlin Steel Co.

F. S. Easterly, secretary of the Stalmaker Steel Co., Frick Building, Pittsburgh, dealer in iron and steel scrap, has resigned and has been succeeded by M. B. Summers, who has been connected with the company for some years.

The Truscon Steel Co. is completing at its works on Albert Street, Youngstown, Ohio, a machine and blacksmith shop 50 x 570 ft. with an extension 30 ft. wide extending for some distance along the main building. The unit is made of steel fabricated in the company's works and was erected by its own employees.

To facilitate handling freight traffic to and from steel plants the New York Central railroad is completing a new terminal at Coalburg, a few miles north of Youngstown, Ohio, at a cost of approximately \$1,500,000. A 15-stall roundhouse, electrically operated turn-table and 80-ft. ash conveyor are among the improvements.

OBITUARY

COLONEL JAMES KILBOURNE, founder and president of the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, died after an extended illness at his home in that city July 7, aged 77 years. He was a native of Columbus and was a grandson of the late James Kilbourne, one of the first settlers in Franklin County, Ohio, in which Columbus is situated. He was a director of the Hocking Valley, Toledo and Ohio Central, and the Columbus, Cincinnati and Midland Railroad Companies, and also a director of the Harden-Clinton and First National Banks. He was president of the Ohio Centennial Commission in 1888 and president of the trustees of the Columbus Public Library for ten years. He organized the Columbus Children's Hospital and was president of it for five years, and was also a member of the Board of Managers of the Associated Charities for a number of years. Among the business organizations to which he belonged is the Columbus Chamber of Commerce, of which he was a director for several years and in 1901 was chosen president. During the Civil War he was breveted major, lieutenant colonel and colonel of volunteers for gallant and meritorious services. He was the Democratic nominee for Governor of Ohio in 1900, but was defeated by George K. Nash. He is survived by his widow, two sons and one daughter. One of his sons, James R. Kilbourne, is vice-president and general manager of the Kilbourne & Jacobs Manufacturing Co.

ALBERT VICKERS, chairman of Vickers Sons & Co., Ltd., one of England's large manufacturers of steel products, guns, ammunition, shells, armor plate, tires and axles, died at Eastbourne, England, July 12, age 81. Vickers, Ltd., besides interests in Russia, Spain and Brazil, ordnance works in Italy and Japan and shipbuilding works in Montreal, Canada, includes the following subsidiary and allied companies: Naval Construction & Armaments Co., Maxim-Nordenfellt Guns & Ammunition Co., Electric & Ordnance Accessories Co., Wolseley Tool & Motor Car Co., William Beardmore & Co. They are capitalized at more than \$20,000,000.

DAVID STUART KENNEDY, for many years prominently connected with the Carnegie Steel Co. at the Homestead Works, died July 9 at his summer home near Pulaski, Pa., following a several months' illness. He was well known among steel men throughout the Pittsburgh and Youngstown districts. Among surviving relatives is J. B. Kennedy, chairman of the board of the Brier Hill Steel Co., Youngstown, Ohio.

JOHN FARRELL, one of the founders and for many years president of the Bailey-Farrell Mfg. Co., Pittsburgh, manufacturer of enamel sanitary ware, died at his home in that city recently. He was born in Ireland, came to this country in 1844, and was a resident of Pittsburgh for more than 70 years.

WILLIAM G. SHARP, president United States Smelting Refining & Mining Co., since its formation in 1906, died suddenly at his home in Wenham, Mass., July 3.

The Corrugated Bar Co., Inc., New York, announces that it has taken over the entire assets and liabilities of the Corrugated Bar Co., a Missouri corporation, and is continuing the business of the latter company, which is in process of dissolution. This means the retirement by purchase of the Garrison interests, which held the majority of the stock of the Missouri corporation from its inception, in 1891, until the recent reorganization. The control now passes to A. L. Johnson, who has been connected with the company since July, 1895. The officers and board of directors of the new corporation are: A. L. Johnson, president; W. H. Kennedy, vice-president and treasurer; Ralph McCarty, secretary; A. E. Lindau, general manager of sales; Lyman Bass, counsel.

Technical Men of War Experience Will Organize

An organization of the technical men of the United States, to be known as the Army Ordnance Association, is being formed to perpetuate the knowledge and preparedness gained through nine months of war material production during the American participation in the war. The object of the association is to keep the United States prepared for an emergency by knowing how to produce the materials needed in the prosecution of a successful war. The founders of this organization believe that their knowledge as technical men as to national manufacturing resources and the kinds of steel, chemicals and machinery needed for war purposes is an important factor of preparedness.

It is hoped to include in the association 10,000 of the scientific and industrial leaders of the nation. Following are a few of the manufacturers included on the temporary founding committee: Herbert W. Alden, vice-president, Timken-Detroit Axle Co.; Waldo C. Bryant, president, Bryant Electric Co.; Robert P. Lamont, president, American Steel Foundries; David C. Seagrave, vice-president, Pacific Coast Shipbuilding Co.; Guy E. Tripp, chairman board of directors, Westinghouse Electric & Mfg. Co.; Major John H. Deventer, editor the *American Machinist*.

The constitution of the Army Ordnance Association gives the following purposes of the organization: "To keep available the highly specialized knowledge necessary for arming the manhood of the nation, by stimulating interest in the design and production of ordnance material; to promote mutual understanding and to effect co-operation between American manufacturers, civilian engineers, reserve and regular army ordnance officers; to provide, when required, the services of competent committees to investigate and report upon special ordnance subjects."

In his paper on "The Present Condition of Research in the United States," before the June meeting of the American Society of Mechanical Engineers, Prof. Arthur M. Greene, Jr., Rensselaer Polytechnic Institute, Troy, N. Y., discussed the origin and status of research activities. In this direction he classified as those carried on in technical school laboratories, engineering experiment stations, co-operative research by associations and between companies and technical institutes, Government activities, commercial research, industrial research, and the work of the National Research Council. Lists of the different organizations, experiment stations, and laboratories, maintained by colleges and manufacturing companies are given, together with a summary of the scope of work by those companies more active in the work. Mention is made of the complex problems involved in rolling metal, which is being carried on with a full-sized rolling mill at the Carnegie Institute of Technology.

The Cutler-Hammer Mfg. Co., Milwaukee, has recently opened an office in Detroit, located at 905 Kresge Building, to expedite the handling of orders and to give the company's customers in and about Detroit better engineering service. The Detroit office is, in reality, a branch of the Chicago office and bears the same relation to it as the Cincinnati office. H. S. Kinsley, who is in charge at Detroit, has taken with him from the Chicago office, C. W. Greenman and M. Dugliss, both of whom were recently mustered out of service. This trio will form the nucleus for the Detroit organization. Prior to going to Chicago, several years ago, Mr. Kinsley was connected with the engineering department at the Milwaukee plant.

Bronzo Alumina Corporation has moved its plant from Tonawanda, N. Y., to 212-218 Winchester Avenue, Buffalo, where it has a new factory, modernly equipped for die and sand casting in brass, bronze and aluminum, with a machine shop for finishing.

The annual congress of the National Safety Council will be held at Cleveland, Oct. 1 to 4.

Death of Samuel T. Wellman

SAMUEL T. WELLMAN, Cleveland pioneer steel man and often referred to as the "father of the open-hearth process of the United States", died suddenly July 11 of heart disease, aged 72 years. His death occurred at Stratton, Me., where he was stricken while on the way to a Maine fishing camp.

Mr. Wellman was born Feb. 5, 1847, at Wareham, Mass., his father at the time being superintendent of the Nashua Iron Co., Nashua, N. H. After attending public school and a year at Norwich University, he served in the Civil War as a corporal of the first New Hampshire Heavy Artillery.

Mr. Wellman went to Pittsburgh in 1867 and assisted in starting the first crucible steel melting furnace built in America at the Works of Anderson, Cook & Co. It melted a ton of steel with an average of 1000 pounds of nut coal which cost less than \$1, while the melting of a ton of steel in crucible in the old fashioned coke furnace took three tons of the very best coke, costing from \$2 to \$3 per ton. This steel furnace was a great success and in a very few years had driven the coke furnace out of use. From Anderson, Cook & Co. Mr. Wellman went to Singer, Nimick & Co. works, Pittsburgh, where he built two crucible steel melting furnaces of the same type as the first one which he helped to install at Pittsburgh. After that he spent some time in the office of the Siemens agents in Boston and also at steel works in different parts of the country, starting crucible steel furnaces. He then went to the Bay State Iron Works in South Boston, Mass., where he built the first open-hearth furnace that was a commercial success in the United States. It made steel of a quality which up to that time had not been reached in this country. The principal use to which it was put in those days was the manufacture of locomotive fire boxes. From South Boston he went back to the old works in New Hampshire where his father was still superintendent, and built for it an open-hearth furnace, a plate mill and bar mill.

Mr. Wellman was a modest man who seldom talked about himself or his achievements, but in June, 1917, at the thirty-seventh annual banquet of the Cleveland Engineering Society, when he and Ambrose Swasey were made honorary members, Mr. Wellman, being unable to attend on account of illness, felt it incumbent upon himself to write a letter to the society, and in this letter he gave some very interesting facts about his career, saying in part:

"I came to Cleveland in 1873 to design and build the Otis Steel Works, with which I was connected as engineer and superintendent for 16 years. It is useless for me to say very much about the history of the Otis Steel Co., as it is too well known here. But there are two inventions which I worked out during the time I was connected with the Otis company that are to-day absolutely indispensable to the economic operation of any open-hearth steel works. I refer to the open-hearth charging machine and the use of the electro-magnet for handling pig iron and scrap steel. Just a few figures will give you a little idea of their importance to the trade and what they are saving every day.

"There were made in this country in 1916 approximately 39,000,000 tons of pig iron and about the same quantity of steel ingots of all kinds. Very conservative figures show that at least half of this, or say 20,000,000 tons was pig iron and scrap handled and used in open-hearth furnaces. This was all handled by the open-hearth charging machine and electro-magnet at least once, the bulk of it twice, and a great deal of it

three times. By the use of the electric open-hearth charging machine, the direct saving in labor is estimated by one of the large users at 25 cents per ton. This was about 10 years ago, and of course labor is much higher to-day. At that time, he estimated the indirect saving in handling of the material charged into the open-hearth furnace (calling it only 20,000,000 tons) of \$10,000,000. If we go back 17 years, this saving amounts to not less than \$85,000,000. This is a big sum of money, but the estimate is far below the maximum amount which has been actually saved. The saving in labor by the use of the electro-magnet in the United States per year at the rate pig iron and scrap are being handled to-day is not less than \$1,500,000. We can very safely say that in the last 10 years at least five times that amount, or the sum of \$7,500,000, has been saved; or a total for both of these inventions of nearly \$100,000,000,—a saving of which any inventor might well be proud. Every open-hearth plant of any size in the world to-day is equipped with these inventions, and they are considered as much a necessary part of the equipment as the furnace itself."

In 1890 with his brother, Charles H. Wellman, and John W. Seaver, Mr. Wellman organized the Wellman-Seaver Engineering Co. Later this company was consolidated with the Webster, Camp & Lane Co., Akron, and became the Wellman-Seaver-Morgan Co., with which Mr. Wellman was associated until his retirement from business in 1900.

Mr. Wellman became a member of the Cleveland Engineering Society in 1882, two years after

its organization, and was president of that society in 1902 and 1903. He was a member of the American Society of Mechanical Engineers, of which he was president in 1900-1901. He had long been a member of the American Iron and Steel Institute and was one of the regular attendants at its meetings. He was married at the age of 21 in Stoneham, Mass., to Julia A. Ballard, who died in Cleveland, July 3, 1914. He is survived by three sons, W. S. Wellman, president the Wellman Products Co., Cleveland and Holley G. and Frederick Siemens Wellman, of the Wellman Bronze Co., Cleveland, and two daughters, Mrs. A. D. Hatfield, Cleveland, and Mrs. C. W. Comstock, of California.

Mr. Wellman was a man of strong personality and although reserved and almost taciturn to those who did not know him well, he was a man of warm heart, and was greatly beloved by his friends. Devoted to his church, the Euclid Avenue Congregational, he was unostentatious in his worship as in all other walks of life. He always displayed a deep interest in young men of promise in the steel industry and was glad to assist them. He found enjoyment in collecting paintings and in travel and fishing. For several years his health had not been good, but he kept closely in touch with the steel industry and attended meetings of the societies, including the meeting of the Institute in New York last May and the Detroit meeting of the American Society of Mechanical Engineers in June.

The Leeds & Northrup Co., Philadelphia, makes the following announcement: "Our factory will be closed from Aug. 2 to 16, inclusive. During that period practically our entire force will be taking their vacations and all production work will be stopped. A cordial invitation is extended to any of our friends who may be passing through Philadelphia during the summer to visit and inspect our factory. We believe that such a visit would be of value to any one interested in electrical measurements or pyrometry."



S. T. WELLMAN

Investigation of Basing System to Be Made

(Continued from page 172)

Chicago. A change was made and all steel has been sold f.o.b. Pittsburgh, so that consumers of steel who buy at the Gary plant of the United States Steel Corporation pay the price of the steel, plus the freight rate from Pittsburgh, although there may not be any freight in it. The freight rate from Pittsburgh to Chicago is approximately \$5.40. The actual freight from the mill to the point of destination is paid by the steel mill, but the freight rate from Pittsburgh to the point of destination is charged to the consumer.

"The effect on Middle West consumers is that it cuts them off from the market east of Chicago. Pittsburgh fabricators can compete in the Chicago district on even terms. The Eastern fabricators get a price on steel \$5.40 lower than those in the vicinity of Chicago, and are able to make the steel up into manufactured products and ship them to Chicago without being at any greater expense than the Western manufacturer in marketing the goods in Chicago."

Judge Gary's Presentation

Judge Gary followed with a general statement of the case from all angles.

"I represent here only the United States Steel Corporation," he said. "The iron and steel industry in this country really started at Pittsburgh many years ago. That was then the cheapest point of production, largely because the fuel was there. The iron ore was brought by water. That being so, of course, the iron and steel products were sold at a price which meant f.o.b. Pittsburgh. Later, plants were started at Youngstown and other points. Their products were sold f.o.b. Pittsburgh. That was the fact at least 40 or 50 years ago. It was to the advantage of users of steel to have a standard base.

"The Pittsburgh base has been maintained ever since with some exceptions. Rails have always been sold f.o.b. mill wherever manufactured. That was because the railroads insisted upon it because their lines extended to the various points, and it made no difference to them where the rails were delivered.

"When the war came on, plates, shapes and bars were sold f.o.b. Chicago, and f.o.b. Pittsburgh, with the object in view of securing the largest production and the most prompt delivery.

"Times and conditions have been changing. The iron and steel industry has grown enormously. Furnaces and mills have been established in various parts of this country. The Steel Corporation has a very large plant at South Chicago and also at Gary. It also has a substantial plant at Duluth. It purchased the Tennessee Coal, Iron & Railroad Co.'s plant at Birmingham during the 1907 panic to relieve a financial situation. Since we bought that property, we have appropriated perhaps \$70,000,000 to make it a very substantial plant.

Effect on Duluth

"During the last two or three years there have been complaints from consumers with regard to the Pittsburgh basing point on the ground that a man in Duluth who wishes to buy steel must pay the freight from Pittsburgh, whereas the material may be manufactured right there in Duluth.

"On the face of it there seems to be injustice to the consumer. But there comes up the proposition whether there would have been any plant at Duluth at all if the Pittsburgh base had not been in effect. Not having such a plant, the city might not have been built up to such an extent as it is. Production costs at Duluth are higher than at Pittsburgh. The cost of production at Gary and Birmingham is as low as any place.

"Mr. Miller says if you can produce iron and steel at as low a figure at Pittsburgh, why should a man who wants to buy steel at Gary pay a larger price than the man at Pittsburgh? Then comes the question: If you are going to change the Pittsburgh basing price, does it or does it not mean a change in the method of doing business to the extent that everything will be sold f.o.b. mill, wherever it may be? Many communities would suffer in consequence of such a policy."

Judge Gary brought out that the War Industries Board, which caused a Chicago base on plates, bars and shapes to be put into effect on Oct. 1, 1917, recommended that it be abolished on July 1, 1918.

Commissioner Murdock remarked that he was particularly interested in the statement that a change in the system might distress many communities and asked Judge Gary to elucidate the point a little further.

"I am not arguing the point," responded Judge Gary. "I am simply trying to show how important the subject is."

"That may apply to Duluth but not to Chicago and Gary, where costs are, if anything, less than at Pittsburgh," commented Mr. Miller.

Question of Jurisdiction

Commissioner Colver brought up the question of jurisdiction.

"We are interested in just how jurisdiction lies," said Mr. Colver. "The complaint shows that inequities exist between fabricators. But the base is a proposition of mills which are not in competition with each other necessarily. Mr. Miller would not say that his competitors were chargeable with the base system. If the competitors are not chargeable with it, is it unfair business practice?"

"We claim discrimination in price and unfair practices under both the Clayton act and the Federal Trade Commission act," said Mr. Miller.

"Why should not Birmingham be a basing point?" asked Commissioner Murdock.

"You'll have them down here too," said Judge Gary.

Continuing, Judge Gary further emphasized the importance of the case. "This is one of the most important questions you will ever have had up if you take jurisdiction, as I believe you should," said he. "It is a proposition of changing a method of doing business. Every community is entitled to be heard and every producer of steel and every class of consumer. I think this commission has jurisdiction on the ground that consumers of steel think there is discrimination in prices. From my standpoint, I would like to have the question fully heard and the whole question settled, so that the Steel Corporation can follow the judgment and decree of the Federal Trade Commission. If it is right to have this changed, I would like to have it done. The matter of the Steel Corporation making a little more or less money doesn't interest me greatly.

"I don't want to say anything to prejudice Mr. Miller's case. I don't want to say anything to prejudice any competitors or communities. Mr. Miller has been after me for three months and I have been discussing it with other steel men, but until I told them that Mr. Miller was prepared to press the matter before the Federal Trade Commission, I did not receive much encouragement. Many of them haven't wanted to change the standard. I'd like you to take jurisdiction, though I don't know that I have a competitor who agrees with me. It will be as big a lawsuit as ever came before any judicial tribunal."

Dual Base Favored

Mr. Miller said he thought that manufacturers as far West as the Pacific Coast from Chicago would like at least a dual base.

"It would seem to me that the fact that customers of the Gary mill of the Steel Corporation are paying an

exaggerated price over that paid by customers of the Carnegie plant of the Steel Corporation at Pittsburgh would justify some action," said Mr. Miller.

Mr. Murdock asked Mr. Miller if he thought the fixing of the Pittsburgh base was justifiable at the start.

"Yes," replied Mr. Miller, "because that was f.o.b. mill. But Pittsburgh no longer occupies that position."

"Why not a Birmingham base?" asked Mr. Murdock.

"I have nothing to say against that," answered Mr. Miller. "I represent a specific section."

"Where would you stop in fixing basing points?" continued Mr. Murdock.

"I do not care to express any opinion on that," said Mr. Miller. "It may be that a double base would satisfy the trade. Perhaps they would want three bases or possibly a mill base."

"It seems to me," said Judge Gary, "the result would be to establish a mill base."

He outlined his idea of the program which should be followed in the hearings, saying: "If you take jurisdiction and you request me to aid, I can call 125 steel men together and ask them to appoint committees. I think the independents should appoint a committee entirely separate from the Steel Corporation as their interests are different. Chambers of commerce of the different cities should be notified. Communities should be represented. Then you should proceed to take testimony. I don't think you could close up in less than six months or possibly a year."

Consumers Will Meet

CHICAGO, July 14.—The Western Association of Rolled Steel Consumers will convene in Chicago on July 16 to determine its plan of action in the hearing on the proposed Chicago base for finished iron and steel prices which is to be held before the Federal Trade Commission. John S. Miller, attorney for the organization, who has returned to Chicago from Washington, where he conferred with the commission last Wednesday, is preparing to file a formal complaint pointing out in detail the grievances of his clients.

Birmingham Steel Corporation's New Shop

The Birmingham Steel Corporation has recently completed at Birmingham, Ala., a large and very complete shop for the fabrication of steel for ships being built by the Mobile Shipbuilding Co., Mobile, Ala. The Mobile Shipbuilding Co. in 1918 was awarded a contract for 12 5000-ton steel vessels, and owing to the fact that practically all of the fabricating capacity of the country was at that time occupied with essential Government work, the Mobile Shipbuilding Co. was obliged to provide its own fabricating plant. By arrangement with the Emergency Fleet Corporation, the plant of the Birmingham Steel Corporation was started. The new plant was designed to provide 4000 tons of fabricated steel a month. The buildings as originally planned were to be built entirely of steel, but owing to extreme shortage of steel, the War Industries Board suggested that wood be substituted, which was done.

The main shop building is 400 ft. long by 250 ft. wide, with an extension 80 x 40 ft. The main building is divided into three units, each one of which is provided with two 36-in. gage industrial tracks, which project out into the material storage yard, and also to the center of the finished storage yard.

In the material storage yard is a crane runway 600 ft. long and 100 ft. wide, down the center of which is a standard gage track on which 12 to 15 cars of raw material can be stored at one time. The cranes are of the curved chord Pratt truss type, being 12 ft. center to center of trusses and at the center of the truss 12 ft. center to center of chords. Each bottom chord consists of two channels on which operates a 5-ton 2-motor Shepard electric hoist.

The plant is fully equipped with punches, shears, bending rolls and other necessary equipment. Each

punch is equipped with a Lysnolm plate-punching table.

H. L. Brittain is president of the Birmingham Steel Corporation and Frank McLaughlin is general manager. They also hold similar positions with the Mobile Shipbuilding Co., Mobile, Ala.; the Terry Shipbuilding Co., Savannah, Ga.; Savannah Dry Dock & Repair Co., Savannah, Ga., and the Jacksonville Dry Dock & Repair Co., Jacksonville, Fla. The new plant was designed by G. S. Bergendahl, chief engineer, and his assistant, W. V. Bickelhaupt. M. E. Allen, assistant general manager, was in charge of construction.

Withdraw Objections to Sales Abroad

As the result of an explanation by Secretary of War Newton D. Baker of sales of machine tools abroad by the United States army, Cincinnati machine-tool builders have withdrawn their objections to such sales, according to Representative A. E. B. Stephens, of Cincinnati. The State Department inquired of the War Department for information regarding the sale of machine tools in Belgium and France, and Secretary Baker sent the following letter to Assistant Secretary of State Polk, a copy also being sent to Representative Stephens, who had also made inquiries of the War Department on behalf of Cincinnati machine-tool builders:

My Dear Mr. Secretary—Your letter inquiring as to the circumstances under which machine tools are being sold in Europe, also for our comment upon the letter from the United States Machine Tool Co., Cincinnati, which you inclosed, has been received.

The policy of this department is to dispose of surplus material both at home and abroad as rapidly as possible and with as little disturbance of the trade as is practical under the circumstances.

In the United States each bureau is, thus far, making its own sales through its district offices under the policy set forth by the Director of Sales. A representative of the Director of Sales has been negotiating the sales abroad.

Sales to date in this country have totaled \$3,200,411.10 for machinery, machine tools and engineering equipment which cost the government \$3,898,833.85. We have therefore disposed of this material for 82 per cent of the cost to the government, which, I think you will agree, is a very creditable showing and does not indicate any disposition on the part of the War Department to disturb the home market.

The sale which is being negotiated with the Belgians by our representatives abroad is for slightly used machines in good condition on the basis of Aug. 1, 1914, prices, plus 55 per cent c.i.f. Antwerp.

The average advance reported by 133 manufacturers of this line from 1914 to 1918 was approximately 93 per cent. Since the armistice the average drop on new machinery has been about 20 per cent.

One of the largest houses reconditioning used machinery states that in normal times their sales of entirely made-over machinery average around 75 per cent of new. For this machinery, sold as it stands, you will readily see that we are not offering it at improperly low prices, as stated by your correspondent, but at very fair prices which ought not materially disturb the trade for new machinery.

The government must dispose of this surplus material, and I think you will agree from the above statements that it has thus far done nothing which could be regarded as more disturbing than necessary under the circumstances.

Respectfully yours,

NEWTON D. BAKER.

Representative Stephens sent copies of the letter to the machine-tool builders, who have accordingly withdrawn opposition to the sale of Government tools abroad. Representative Stephens received a letter from O. H. Broxterman, president John Steptoe Co., Cincinnati, which said, in conclusion:

"And we want to say that, after the explanation that was given us, we believe it is good policy for the Government to dispose of the machine tools which they have on the other side in Belgium at whatever prices they can get."

Topper & Rosenthal, Columbus, Ohio, is the name of a new firm that has established a plant on Eleventh Avenue for reclaiming old metals, and scrap iron and steel scrap. The firm has a yard which covers seven acres, and the plant is well equipped. Max Topper and M. A. Rosenthal are the principal members.

Machinery Markets and News of the Works

IMPROVEMENT SUSTAINED

Creusot Works Wants Heavy Tools

New England Feels Demand for Labor Saving Machines to Offset Labor Scarcity

Many indications of the betterment in the demand, both domestic and foreign, compel attention. Inquiries come from more diversified sources, less stress being laid on the activity of the automotive industries. In general, quick deliveries are wanted.

In New York a large manufacturer has received an order for 42 large lathes for the Washington naval ordnance plant, the amount involved approximating \$750,000, this being the most noteworthy transaction anywhere, although there are numerous others of a sort that make for a good and healthy market.

The Creusot Works, of France, through a representative here, is inquiring for 28 large tools to be used in the manufacture of steam turbines, the list being the first large one for export since the signing of the peace treaty. Chicago has received some export business, and Cincinnati reports quite an active demand for small tools to go to the East coast of South America, while Spain and the Scandinavian countries have been buyers.

In New England a quick change has come to the contract work and jobbing shops, with whom business was lately dull. Almost overnight they have all they can do. Orders have come from many directions and underlying them all is seen an effort to meet a growing situation in respect to inadequate and high-priced labor, in other words, labor saving machinery is wanted. Both Milwaukee and Cincinnati report a scarcity of both skilled and unskilled help.

Cincinnati tool builders incline more to the point of raising prices, inasmuch as their costs are advancing. A shorter work day, at the old wage rates, is equivalent to wage advances.

Business at Chicago is in the main satisfactory, and Milwaukee notes less hesitancy to proceed with shop extensions and new work.

Western districts continue to show more activity than prevails in New York, but a general betterment cannot be questioned.

It is reported from Toronto that the strike in the machinery and metal trades, is nearing a settlement, although many of the strikers have left the district to secure work elsewhere. Meanwhile, deliveries are seriously hampered.

The western division of the National Railways has issued a list of about 60 machine tools, and is in the market for small tools for the St. Malo shops, Quebec.

New York

NEW YORK, July 15.

The Framamer Industrial Development Corporation, 21 East Fortieth Street, New York, representing in the United States Schneider et Cie of France (the Creusot Works) and other French companies, has issued the first large list of machine-tool equipment for export that the trade has received since the signing of the peace treaty. Twenty-eight large tools are inquired for and immediate delivery is required. It is understood by the trade that the equipment is wanted for a steam turbine plant in France. The list follows:

- Two planers, 42 x 42 in. x 10 ft.
- Two planers, 72 x 72 in. x 13 ft.
- Two planers, 8 x 8 x 26 ft.
- Two universal horizontal boring and drilling machines, 3½ x 6 in.
- One 36-in. boring and turning mill.
- One 51 or 52-in. vertical boring and turning mill.
- Two 17 or 18-in. single traveling head shapers.
- Two 22-in. single traveling head shapers.
- One 26-in. single traveling head shaper.
- Two 7-ft. radial drills.
- Two 10-ft. radial drills.
- One vertical milling machine, diameter of spindle 3 in.
- One vertical milling machine, diameter of spindle 4 in.
- One oil grooving machine, maximum diameter of bushings, 5½ in.
- One 2½-in. single head bolt threading machine.
- One 4-in. single head bolt threading machine.
- One horizontal key-seating machine, Dropp & Rein, or equivalent.
- One 18-in. slotter.
- One 24-in. slotter.
- One spur gear cutting machine, 80 in. diameter.

One of the largest orders placed within recent weeks has been awarded to the Niles-Bement-Pond Co., New York, by the Navy Department. It calls for 42 large lathes for the Washington naval ordnance plant, the cost of which is approximately \$750,000. The largest buying of the week by

any manufacturing company was done by the Spicer Mfg. Corporation, Plainfield, N. J., which purchased about 20 tools. The National Equipment Co., Springfield, Mass., manufacturer of candy machinery, has bought a number of tools and is working 22 hours a day at its plant to fill the large number of orders it has received for candy-making equipment. The A. B. See Electric Elevator Co., New York, with factory at Jersey City, has bought two large lathes.

The Southern Sales Corporation, 68 William Street, New York, is in the market for a 24-in. shaper, a 36-in. x 16-ft. heavy duty screw cutting gap lathe and a 36-in. radial drill for export to Cuba. Belt-driven machines, new or second-hand, are desired.

The American Motor Truck & Tractor Co., 110 West Fortieth Street, New York, has purchased the plant of the Portland Mfg. Co., Portland, Conn., and will equip it for the manufacture of motor trucks and tractors. A list of machine tool requirements is being prepared by the company's engineers and will be issued to the trade within a few weeks.

The Singer Mfg. Co., Elizabeth, N. J., which is building a new foundry, with a capacity of 200 tons of castings daily, has received bids on a monorail electric hoist system, and will shortly inquire for several standard bridge cranes. The Bethlehem Steel Co., Bethlehem, Pa., is asking for bids on seven cranes of the following capacities: Two 40-ton, three 15-ton, and two 10-ton. The Treadwell Engineering Co., Easton, Pa., will soon require several large-capacity cranes.

An inquiry is in the market for a 15-ton crane from Fraser, Brace & Co., 1328 Broadway, this company being one of four that will build ship repair plants to be operated in conjunction with floating dry docks to be built and turned over to them by the Emergency Fleet Corporation. The other companies are the Norfolk & Hampton Roads Ship Repair & Dry Dock Corporation, Norfolk, Va.; the Perth Amboy Dry Dock Co., Perth Amboy, N. J., and the Ramberg Iron Works, Brooklyn, N. Y. James Stewart & Co., 30 Church Street, will build the plant for the Norfolk concern. Fraser, Brace & Co. have also been in the market for plate-working machines, but have not made purchases yet.

The Platt Iron Works, Dayton, Ohio, is offering about 200 used machine tools for sale. An auction sale of metal-

working and woodworking machines was held on Thursday, July 10, at the plant of the Standard Aircraft Corporation, Elizabeth, N. J.

Business generally in machinery and allied lines is not brisk in Eastern markets, but a fair number of orders is being taken by some sellers. All are optimistic as to the future, machinery houses estimating that millions of dollars worth of business is being held up by Eastern manufacturers pending further improvement in the business situation. Prices are holding firm, and some advances are reported. A manufacturer of automatic turret lathes quotes higher, and a manufacturer of a special automatic machine used largely for automobile work has also announced an advance.

Albert T. Hoagland, 116 St. Marks Avenue, Brooklyn, N. Y., operating an automobile repair plant, has had plans prepared for a one-story machine shop, 25 x 100 ft., on Underhill Avenue, near Dean Street, to cost \$10,000.

The Manhattan Railway Co., 165 Broadway, New York, has filed plans for extensions in its one-story machine and mechanical repair shop at Lexington Avenue and Ninety-eighth Street, to cost about \$50,000.

The Engineering & Transportation Products Co., New York, has been incorporated with a capital stock of \$10,000 by H. J. Wheeler, W. Kyle and W. J. Hill, 1219 Sterling Place, Brooklyn, to manufacture mechanical specialties.

The Universal Road Machinery Co., Kingston, N. Y., manufacturer of road machinery, grading equipment, etc., has increased its capital stock from \$75,000 to \$200,000.

The State Hospital Commission, Albany, N. Y., will receive bids up to 3 p. m., July 23, for power plant equipment, including engine, electric generator and auxiliary apparatus, for the State Hospital, Brooklyn, N. Y. L. F. Pilcher, Capital Building, Albany, is State architect.

The Hamilton & Chambers Co., 29 Broadway, New York, structural steel and iron products, has incorporated with a capital stock of \$10,000, the Hamilton & Chambers Co., of the West Indies. John H. Hamilton, George H. Mitchell and E. A. Miller are the incorporators.

The J. M. Lehmann Co., 101 Varick Street, New York, manufacturer of machinery and parts, with shop at 13 Laight Street, has increased its capital stock from \$25,000 to \$50,000.

The West Fiftieth Street Garage Corporation, 412 West Thirty-eighth Street, New York, will build a two-story machine repair and automobile service works, 50 x 100 ft., at 540-42 West Fiftieth Street, to cost \$18,000.

The Briggs Engineering Co., 227 Twenty-fourth Street, Brooklyn, manufacturer of mechanical products, has increased its capital stock from \$50,000 to \$100,000.

Wheolock Lovejoy & Co., Inc., 23 Cliff Street, New York, jobber in iron and steel products, has filed plans for a one-story building, at 131-140 Lyons Avenue, Newark, N. J., to cost \$20,000.

The Empire Specialty Co., 63 Sanford Street, East Orange, N. J., has filed notice of organization to manufacture automobile parts. Harry S. Neats heads the company.

The Bassick Co., 574 Ferry Street, Newark, N. J., manufacturer of castors, etc., has filed plans for a one-story annealing building and air compressor works.

A. W. Faber, Inc., Newark, N. J., manufacturer of hard rubber goods, with plant at 41 Dickerson Street, has been incorporated with a capital stock of \$150,000 by John T. Elliott and Samuel Kaufman.

R. & J. Dick, Ltd., Passaic, N. J., operating a plant on Colfax Avenue for the manufacture of belting, has filed articles of incorporation as the R. & J. Dick Co., with a capital stock of \$2,000,000.

The American Shell Co., Paterson, N. J., operated by the T. A. Gillespie Co., 50 Church Street, New York, and occupying the former plant of the East Jersey Pipe Co., 350 Twenty-first Avenue, is having plans drawn for its proposed one-story foundry, 120 x 240 ft. The structure, with equipment, is estimated to cost \$100,000.

The Utica Metal, Iron & Waste Co., Utica, N. Y., has been incorporated with a capital stock of \$15,500 by A. Merrill, I. Goldbas and E. Managan, to manufacture castings.

Clark Brothers, Jersey City, N. J., have filed notice of organization to manufacture tools, with works at 2812 Boulevard. William A. and David H. Clark head the company.

F. Ferguson & Son, 1122 Clinton Street, Jersey City, N. J., operating a foundry for the manufacture of grate bars, propeller wheels, etc., is planning for a one-story foundry to cost \$10,000.

A machine and general repair shop will be established by the Perth Amboy Hardware Co., 311 Madison Avenue, Perth Amboy, N. J., in connection with its new reinforced-

concrete building, 50 x 75 ft., to be erected at 392-94 Division Street, at a cost of \$10,000.

The Gnone Mfg. Co., Elizabeth, N. J., has been incorporated with a capital stock of \$60,000 by Frederick A. Hemphill, Augustus F. and Albert F. Bender, to manufacture mechanical toys.

The Acme Machine Co., 3 McPherson Place, Jersey City, N. J., has filed notice of organization to manufacture automobile parts, handle general repair and machine work, etc. William Wehman, 313 Fifteenth Street, West New York, and Edward A. Higgins, 207 St. Paul's Avenue, Jersey City, head the company.

The Standard Parts Co. of America, Rutherford, N. J., has been incorporated with a capital stock of \$1,000,000 by William H. J. Ely, Fred J. Miles and Jules Arboca, to manufacture automobile parts.

A. P. Munning, Matawan, N. J., operating a local metal-working and electroplating plant, is having plans prepared for two one-story additions for increased capacity, 42 x 150 ft., and 42 x 115 ft., respectively.

The S. B. R. Specialty Co., East Orange, N. J., has been incorporated with a capital stock of \$100,000 by H. S. Neats, August and A. Milton Soffel, to manufacture anti-friction devices for automobiles.

The Rotary Machine & Engineering Co., Lyndhurst, N. J., has been incorporated in Delaware with a capital stock of \$500,000 by M. J. Noble, Lyndhurst; J. A. Fréère, Newark, and J. M. Freere, Wilmington, Del., to manufacture vacuum pumps, etc.

The J. G. Schmidt Iron Works, Passaic, N. J., with plant at 360 Harrison Street, has filed articles of incorporation under its present name, with capital of \$100,000 by William Hassan, Joseph Vandermade and Frederick Hauchwitz, to manufacture ornamental iron products.

The General Electric Co., Harrison, N. J., has filed plans for a two-story brick building on North Eighteenth Street, East Orange, to cost about \$40,000.

The Frazer, Brace & Clarke Dry Dock Corporation, Staten Island, N. Y., has been incorporated with a capital stock of \$1,200,000 by C. E. Frazer, C. C. Clarke and R. H. Strahan, 44 West Ninth Street, to build and repair ships of all kinds, with works in Richmond Borough.

The New Diamond Point Pen Co., 44 East Twenty-third Street, New York, with plant at 380 Canal Street, has increased its capital stock from \$100,000 to \$100,000.

The Magneto Winding Co., 1723 Eighth Avenue, Brooklyn, N. Y., affiliated with the Apollo Magneto Co., is negotiating for property at Butler, N. J., for the establishment of a plant.

The Moran Shipyards Corporation, New York, has been incorporated with a capital stock of \$25,000 by E. G. Halbert, M. Rogers and W. C. McCreery, 217 Prospect Place, to build vessels and operate a repair works.

Magid, Katzman & Strober, Brooklyn, N. Y., operating a metal works at 56 Boerum Street, have taken out a permit for a two-story brick shop, 100 x 107 ft., at Wyckoff and Flushing avenues, to cost \$100,000 including equipment.

The Hoistaway Mfg. Co., New York, has been incorporated with a capital stock of \$30,000 by H. G. and R. G. Banker, and W. E. Jackson, 2664 Briggs Avenue, to manufacture hoisting and other machinery.

The Fred Myers Phonograph Needle Sharpener Co., New York, has been incorporated with a capital stock of \$200,000 by H. Roth, L. Strauss and J. A. Gilman, 225 Fifth Avenue.

The Victory Engine Co., New York, has been incorporated with a capital of \$50,000 by C. O. Assmus, C. H. Atkins and M. A. Farley, 28 Sterling Place, Brooklyn, to manufacture engines and parts.

The Kayenn Mfg. Co., Brooklyn, N. Y., manufacturer of electrical goods, has leased a floor in the building at 291-3 Adams Street, for a new works.

The Smith-Randall Engineering Corporation, New York, has been incorporated with a capital stock of \$25,000 by F. W. Smith, 18 Norwood Avenue; G. W. Randall, 972 Sterling Place, and M. F. Hickman, 210 East Forty-second Street, to manufacture engines, motors, etc.

The Metal Hose & Tubing Co., 253 Tillary Street, Brooklyn, N. Y., has increased its capital stock from \$15,000 to \$300,000.

The Gould Construction Co., 233 Broadway, New York, will build a one-story machine shop, 100 x 175 ft., on Grand Street, to cost \$25,000.

The Simplex Tobacco Machinery Co., New York, has been incorporated with a capital stock of \$500,000 by N. M.

Koenberg, M. Levy and J. M. Gross, 628 East Twenty-sixth Street.

The Chatham Die Casting Corporation, New York, has been incorporated with a capital stock of \$35,000 by B. Brudney, 1235 Franklin Avenue; J. Preuser, 85 Fort Washington Avenue, and A. Haakanson, New York, to manufacture machinery, die castings, etc.

The Eastern Parts Mfg. Co., 135 Spring Street, New York, has increased its capital stock from \$59,000 to \$175,000.

The American Can Co., 120 Broadway, New York, is taking bids for the erection of a plant at Portland, Me., to cost about \$300,000, including equipment.

The American Precision Works, 135 Cedar Street, New York, manufacturer of electrical, surgical and dental instruments, plans to remove its works to one of the suburbs of New York, probably Newark, where it will increase its manufacturing schedule and take up the production of instruments and apparatus for other industrial purposes, particularly for airplanes, airships, automobiles, etc. K. G. Frank is president.

The Sipp Machine Co., specialists in textile machinery and manufacturer of sensitive drill presses, Erie Railroad, Keen and Warren streets, Paterson, N. J., is building an addition to its plant to be used as a machine shop for increased output, not for a silk mill, as has been reported.

The Horrocks-Ibbotson Co., Utica, N. Y., manufacturer of fishing reels, has awarded contract to the Kimberley Construction Co., Marce Building, for a three-story addition, 24 x 72 ft., to cost \$20,000.

The Board of Contract and Supply, Binghamton, N. Y., is considering the erection of a municipal electric lighting and power plant on Conklin Avenue. Frederick Smith is secretary.

The National Oven Co., Beacon, N. Y., manufacturer of bakers' ovens, has increased its capital from \$50,000 to \$500,000.

Philadelphia

PHILADELPHIA, July 14.

Smith Drum & Co., Allegheny Avenue, near Fifth Street, Philadelphia, engineers and machinists, have had plans prepared for a one-story brick addition, 25 x 100 ft., and 25 x 95 ft., to cost \$23,000.

Following its recent incorporation in Delaware with capital stock of \$3,000,000, the Pressman Tire & Rubber Co., 302 North Broad Street, Philadelphia, has arranged for a stock issue of \$500,000 to provide for operating capital and proposed manufacturing activities.

The Philadelphia Mineral Flooring Co., Inc., 3632 Summer Street, Philadelphia, has filed plans for a two-story addition 50 x 60 ft.

The Hess-Bright Mfg. Co., Front and Erie streets, Philadelphia, has taken bids for a two-story addition, 43 x 105 ft., at its ball bearing factory.

The Niles-Bement-Ponds Co., Twenty-first and Callowhill streets, Philadelphia, has filed plans for a one-story power plant, 44 x 60 ft., at Swanson and McKean streets, to cost \$10,000. A one-story brick pumping plant will also be erected.

A one-story boiler plant will be erected by the Griffon Co., Adams and Wingohocking streets, Philadelphia, in connection with its proposed textile works at Unity and Oakland streets, with total cost estimated at \$104,000.

The N. & G. Taylor Co., 300 Chestnut Street, Philadelphia, manufacturer of tin plate specialties, has conveyed its factory buildings on Tasker Street, between Vandalia Street and Delaware Avenue, to E. D. Newman, for a consideration said to be \$117,500; the property is about 148 x 380 ft.

The Electrolyte Storage Battery Co., Philadelphia, has been incorporated in Delaware with capital of \$200,000 by F. R. Hansell, Land Title Building, and E. M. MacFarland, to manufacture storage batteries, etc.

The Fairmount Machine Co., Philadelphia, has leased the entire building at 10 North Tenth Street for a term of years for the establishment of its local works.

The addition to be erected by the Victor Talking Machine Co., Camden, N. J., will be two stories, 35 x 91 ft., to cost with equipment \$40,000, will be for grinding work. Irwin & Leighton, 126 North Twelfth Street, Philadelphia, have the building contract.

The Camden Auto Radiator Co., Camden, N. J., has awarded contract to Potts Brothers & Cooperson, 129 North Eleventh Street, for a two-story addition to its machine shop, 18 x 60 ft.

The Hutchinson Storage Battery Co., Trenton, N. J.,

has filed plans for a one and two-story works building at 209-13 South Warren Street, to cost \$16,500.

The International Motor Co., Allentown, Pa., has taken bids for a one-story addition, 300 x 600 ft., to be used as an assembly extension and for general production. The structure, with equipment, is estimated to cost \$150,000.

The Adder Machine Co., Wilkes-Barre, Pa., manufacturer of visible adding machines, etc., has filed notice of change of name to the Wales Adding Machine Co.

The Modern Machine Works, Slatington, Pa., has leased property in the Rudolph Building, and will commence the immediate installation of machinery and equipment for a new machine shop.

The War Department, Washington, is planning for a building at the aviation station, Middletown, Pa., to be equipped as a permanent machine and repair shop for aircraft work.

In connection with the proposed removal of the plant of the Sharples Separator Co., West Chester, Pa., manufacturer of cream separators and other dairy equipment, to a new location, as recently announced, arrangements are being made to utilize the present local plant exclusively for the production of milking machines. A branch organization will be formed to carry out this operation, to be known as the Sharples Milker Co., with L. P. Sharples as manager. A new plant, it is understood, will be erected for the separator works.

The Shanksville Electric Co., Shanksville, Pa., has been incorporated with a capital stock of \$5,000 by W. H. and C. E. Fox and J. O. Lambert to manufacture electric equipment. J. W. Baltzer has been elected treasurer.

In connection with the building to be erected by the Packard Motor Car Co., 317 North Broad Street, Philadelphia, on Cameron Street, near Mulberry Street, Harrisburg, Pa., a complete repair shop will be installed. An auxiliary repair works for light operations will also be established. The structure will cost about \$100,000.

The American Farm Equipment Co., Williamsport, capitalized at \$100,000, has been incorporated to manufacture gas engines, electric lighting plants, radiators, tanks, etc., and to conduct a general foundry and machine business. The incorporators are Samuel J. MacMullan, William J. Housel and Charles A. Blair.

The Tri-Weld Co., Philadelphia, has been incorporated with a capital stock of \$5,000 by William C. Taylor, Wynnewood, Pa.; James H. Wilkinson, 4242 Wyalusing Avenue, Philadelphia, and J. C. McEvoy, Llanerch, to manufacture machinery, engines and mechanical parts.

The Robert & Mander Stove Co., Philadelphia, plans to increase its indebtedness from nothing to \$20,000, to provide additional working funds. Stanley Grady is secretary.

The Fleetwood Metal Body Co., Fleetwood, Pa., has increased its stock: Preferred stock has been increased from \$35,000 to \$150,000 and common stock from \$215,000 to \$350,000. Nicholas J. Kutz is secretary.

The Treadwell Engineering Co., Easton, Pa., at a recent directors' meeting, voted to extend its plant to care for its increasing business. Work has commenced on a 90 x 220 ft. extension to the main erection shop, with its full equipment of cranes, tools, etc., and a new central heating system for the shops and office building. The plans later include the erection of a second steel foundry for the manufacture of heavy steel castings; also some additions to the iron foundry. The company has recently developed a large export trade.

New England

Boston, July 14.

The contract and jobbing machine shops are exceedingly busy, where only a few weeks ago they were exceedingly dull. Work is coming to them from a wide variety of sources. A large part of it is, as usual, for jigs, fixtures and special tools, and also special machinery. An increasing effort to secure increased production per hour of human labor is in evidence. The average shorter hours of employment without compensating reduction in weekly wages is a compelling force to lead manufacturers to better equipment. Never before, it is said, has such concentrated attention been paid to this subject. This is one reason why the textile machinery people are busier than ever before, the demand extending to machinery for the manufacture of all sorts of textile materials, embracing every fabric and garment wrought by machinery. The textile mills throughout Massachusetts are compelled by law to reduce to a 48-hr. week for women and children, and as women and young people predominate in the textile industry the mills must shut down completely for production beyond those hours, excepting as automatic machinery may keep running without human direction.

The machinery builders and dealers report the improved business continuing, in the face of the normally duller time of year. The automobile and tractor people are still important buyers, but the greatest factor of the New England market continues to be the textile machinery builders, who continue the increasing of their productive capacity by the purchase of machine tools.

The Wyman & Gordon Co., Worcester, Mass., manufacturer of drop forging, will erect a one-story building, 36 x 44 ft., which will be used as a dining-room, rest-room and first-aid hospital.

The Warren Steam Pump Co., Warren, Mass., is erecting additions to its works, comprising several buildings, which will permit it to spread out with existing equipment and add new machinery.

The Central Autogenous Welding & Mfg. Co., 98 Union Street, Worcester, Mass., has purchased the building at 110-114 Union Street and will move to its new quarters in August, thus giving needed additional room. John A. Braithwaite, who founded the business in 1910, is president and treasurer and Frank Bennett is mechanical engineer.

A one-story addition will be erected by E. D. Codman, 27 Kilby Street, Boston, for the F. S. Payne Co., Cambridge, Mass., manufacturer of freight elevators. Headquarters of the company are at 295 Franklin Street, Boston.

The Package Machinery Co., 132 Bernie Avenue, Springfield, Mass., has awarded contract to Fred. T. Ley & Co., Inc., 496 Main Street, Springfield, for a two-story addition to cost \$14,000.

The Continental Wood Screw Co., New Bedford, Mass., is taking bids for the construction of a two-story addition, 45 x 160 ft., to cost \$50,000.

An automobile sales and service building, six stories, 195 x 260 ft., is to be erected by the Buick Co., 17 Lawton Street, Boston, Mass., at a cost of about \$250,000.

The General Fire Extinguisher Co., 275 West Exchange Street, Providence, R. I., is having constructed a pipe shop, three stories, 70 x 120 ft., at a cost of about \$75,000.

Case & Marshall, Inc., Hartford, Conn., has let contract to the J. H. Crozier Co., 721 Main Street, Hartford, for a boiler house to cost \$10,000.

The American Radio & Research Corporation, Tufts College, Medford, Mass., will erect a factory, three stories and basement, 24 x 72 ft., and two stories, 20 x 36 ft., at a cost of about \$250,000. A. D. Wright, 40 State Street, Medford, Mass., is the architect.

The Torrington Co., Torrington, Conn., has let contract to the Torrington Building Co., Torrington, for a four-story factory addition, 50 x 300 ft., to cost \$60,000.

The H. C. Cook Co., toolmaker and manufacturer of sheet-metal novelties, Ansonia, Conn., has had plans drawn by the Fletcher-Thompson, Inc., Bridgeport, Conn., for a one and two-story factory building, 80 x 290 ft., to cost about \$85,000.

The Mills Machine Co., Salem and Market streets, Lawrence, Mass., will build a machine shop and office building, 96 x 100 ft., to cost \$30,000. This will be of brick and steel construction.

The Hewel Belting Co., Trumbull Street, Hartford, Conn., is having plans drawn by H. A. Wilcott, Elmwood, Conn., for a two-story factory to cost \$200,000.

Scott & Williams, Laconia, N. H., manufacturers of knitting machinery, are erecting a five-story factory building, 60 x 200 ft. W. H. & H. A. Root, 1 Beacon Street, Boston, are the contractors.

The Hemphill Mfg. Co., Central Falls, R. I., manufacturer of knitting machinery, is having a two-story and basement addition, 38 x 153 ft. and 25 x 48 ft., and a new one-story shop building, 38 x 189 ft., erected by the Humes Construction Co., Providence, R. I., at a cost of about \$65,000.

J. A. Merson, Inc., Bridgeport, Conn., has been incorporated with a capital stock of \$25,000 by Julius A. and Ray Merson and Louis Baumrind, to manufacture iron and steel products.

The Perfection Shear Co., Bridgeport, Conn., has been incorporated with a capital stock of \$500,000 by E. T. Von Wettberg and G. P. Brett, Jr., Fairfield, to manufacture scissors, shears, knives, etc.

The J. T. Young Boiler Co., Norwich, Conn., has been dissolved.

The Rhode Island Malleable Iron Works, Hillsgrove, R. I., has awarded contract to Williams & Merchant, Inc., 86 Weybosset Street, Providence, for a three-story addition, 25 x 40 ft.

The Waterbury Wire Die Co., Waterbury, Conn., has been incorporated with a capital stock of \$10,000 by William H. Mahoney, J. P. Wall and I. C. Spiers, to manufacture emery wheels, drawing plates, wire, tools, etc.

A hydroelectric power plant to cost about \$80,000 will be erected by the Nightingale-Morse Mills, Providence, R. I., at their branch works at Putnam, Conn.

The Wallingford Mfg. Co., Wallingford, Vt., manufacturer of hand farm tool implements has completed the establishment of a new addition for the manufacture of handles for farming tools, etc.

The Massachusetts Machine Shop, Inc., Worcester, Mass., manufacturer of metal stampings, etc., with plant at 72 Commercial Street, has removed its works to a new building at 817 Albany Street, Boston, where operations in the future will be conducted. The new location will provide enlarged quarters and allow for increased capacity. The structure will be occupied jointly with the A. A. Knights & Sons Corporation, the officers of which company are interested in the Massachusetts Machine Shop. Harry W. Knights is president and Arthur A. Knights treasurer.

The Schwerdtle Stamp Co., 41 Common Street, Bridgeport, Conn., manufacturer of dies, stamps, etc., is planning for a three-story addition, 30 x 60 ft., to cost \$25,000 including equipment.

The New Haven Carriage Co., New Haven, Conn., manufacturer of carriages, wagons, parts, etc., has awarded contract to the Sperry Engineering Co., New Haven, for a two-story brick addition, 52 x 160 ft., on Hamilton Street, to cost \$45,000.

The Pequot Brass Foundry Co., Norwich, Conn., has filed notice of dissolution.

The Muirhead Gas Heater Co., Pawtucket, R. I., has been incorporated with a capital stock of \$10,000 by James Muirhead, 139 Maple Street; Frank Gravin and Edward L. Letourneau, to manufacture gas heaters, etc.

The New London Ship & Engine Co., Groton, Conn., is planning for a one-story addition, 60 x 70 ft., for the manufacture of marine engines. It is estimated to cost \$25,000.

The Canopus Iron Corporation, Garrison, N. Y., has been incorporated with a capitalization of \$1,000,000 by J. G. Pearce, G. O. Angell and R. I. Gutham 353 West Fifty-seventh street, New York.

The Universal Road Machinery Co., Kingston, N. Y., has increased its capital stock from \$75,000 to \$200,000.

Buffalo

BUFFALO, July 14.

The Superior Bronze & Aluminum Mfg. Co., Buffalo, capitalized at \$50,000, has been incorporated by J. L. Dunn, E. O. Pless and W. D. Hopkins, 150 Hodge Avenue, Buffalo.

The Jewell Steel & Malleable Co., Buffalo, is enlarging its foundry at Hertel Avenue and the New York Central Railroad Belt Line and building extensive pattern vaults.

The General Fuel Saving Corporation, Rochester, has been incorporated with a capital stock of \$225,000 by E. J. Shea, F. B. Shea and V. D. Ludington, Holley, N. Y., to manufacture fuel saving devices.

The Union Carbide Co., Niagara Falls, N. Y., is building a factory addition and cafeteria building, 38 x 120 ft., at its plant at Union Street and the New York Central Building.

W. S. Hoffman, 329 Tuckel Street, Syracuse, is building a one-story foundry and power house 50 x 200 ft., of steel and concrete on Tuckel Street to cost \$50,000.

The Union Bag & Paper Corporation, Edw. B. Murray, vice-president, Woolworth Building, New York, is having plans prepared for a factory building 200 x 600 ft., three stories, to be erected at Hudson Falls, N. Y., at an estimated cost of \$500,000.

The Northwest Foundries Co., Curlew and Villa streets, Rochester, has let contracts for additions 31 x 64 ft. and 31 x 55 ft., to its foundry plant.

The Rickert-Shafer Co., Erie, Pa., will build a two-story addition, 33 x 150 ft., of steel and brick construction, to be ready for occupancy this fall. The company has placed orders for a number of machine tools, but will not order the bulk of the shop equipment until the building is completed. First consideration will be given to a hardening department. The company manufactures the Boehm automatic die head and the R. & S. tapping machines, and contemplates placing other machines on the market. It was reported to the directors, who met July 2, that sales this year had equaled those of the first six months of 1918.

The Empire Axle Co., Dunkirk, N. Y., recently incorporated with a capital of \$400,000, contemplates an extension to its present facilities to enable it to manufacture 2½-ton and 3½-ton worm drive units. The present plant is devoted exclusively to the output of 1-ton and 1½-ton sizes, of which it will shortly turn out around 250 a week. The present corporation is a reorganization of the Empire Axle Co. O. F. Hakes is president and assistant treasurer, E. H. Caldwell

is vice-president, chief engineer and assistant secretary, and H. W. Foley is sales and advertising manager.

The Wire Wheel Co. of America, Elmwood Avenue, Buffalo, manufacturer of wheels for motor cars, has awarded contract to the J. W. Cowper Co., Fidelity Building, for an addition to cost \$15,000.

The Class Auto Top Corporation, Buffalo, has been incorporated with a capital stock of \$50,000 by C. P. and J. Amick, and J. W. Bradley, to manufacture automobile tops, frames, etc.

The Cary Safe Co., Buffalo, manufacturer of vaults, etc., is now operating at its new plant at Niagara and Ferry streets. Machinery and equipment from the former works at Scott and Chicago streets, where the company has been located for the past 40 years, has been removed to the new plant. The company recently increased its capital stock from \$100,000 to \$200,000.

The Commercial Aeroplane Co., Buffalo, has been incorporated with a capital stock of \$100,000 by E. N. Hickey, G. W. Simpson and I. Hamilton, Rochester, to manufacture airplanes and parts.

The Monarch Refillable Fuse Co., Jamestown, N. Y., manufacturer of fuses, etc., has increased its capital from \$100,000 to \$200,000.

The Ellicott Motor Service Co., Buffalo, has been incorporated with a capital stock of \$200,000 by Harold W. Hunsiker, 29 Hodge Avenue; Roscoe R. Mitchell, Frank J. Maguire and Thomas K. Christy, Fidelity Building, to manufacture motor parts, specialties, etc.

The Atterbury Motor Car Co., Hertel and Elmwood avenues, Buffalo, is planning to increase the capacity of its automobile manufacturing plant by the construction of two additions to cost \$200,000. The first structure to be erected will be a one-story extension, 80 x 180 ft., to cost \$50,000, including equipment. This will be followed by a one-story assembling works, 100 x 450 ft., to cost \$150,000. This latter structure, it is understood, will be built in the fall. Employment will be given to about 300 additional men at the plant.

The recent incorporation of Beals, McCarthy & Rogers, Inc., Buffalo, with capital stock of \$1,000,000, follows a partnership under different names since the organization of the company in 1826 by Samuel F. Pratt and Edward P. Beals, under the name of Pratt & Co. Eugene J. McCarthy is president and Charles P. Rogers is secretary and treasurer. With Pascal P. Beale, Messrs. McCarthy and Rogers constitute the directorate.

The Curtiss Aeroplane & Motor Corporation, Elmwood Avenue, Buffalo, is arranging plans for the construction of 225 airplanes and 200 motors at its local works on Churchill Street; 150 airplanes will be of the new Oriole, or three-passenger land type, and 75 of seaplane type. The motors will be of the Curtiss 150-hp. design.

The Otter Creek Power Corporation, Glenfield, N. Y., has been incorporated with a capital stock of \$35,000 by H. S. Lewis, H. D. and G. L. Cornwall, Beaver Falls, to operate an electric power plant for local service.

The St. Lawrence Rivers Motor & Machine Co., Clayton, N. Y., is planning a new one-story automobile service and machine repair works to cost about \$15,000.

The Erie Mop & Wringer Co., Erie, Pa., has acquired property in the Adams district, Rochester, N. Y., and plans the construction of a plant with about 30,000 sq. ft. floor space for the manufacture of wringers, etc. J. L. Klink is president.

The Auto Quip Mfg. Co., Rochester, N. Y., has been incorporated with a capital stock of \$60,000 by W. J. Woerne, R. C. E. and E. R. Wirth, to manufacture automobile parts, specialties, etc.

The Humphrey Die & Tool Corporation, Salem, N. Y., has been incorporated with a capital stock of \$6,000 by A. H. Humphrey, J. H. Potter and S. C. Brown to manufacture tools, dies, machinery, etc.

Clemson Brothers, Middletown, N. Y., manufacturers of hack saws, have had plans prepared for a one-story addition, 80 x 140 ft., to cost \$20,000.

The Madison Tire & Rubber Co., Buffalo, is completing the construction of a new plant on property recently acquired on Spencer Street, extending to Babcock Street, for the manufacture of automobile tires and tubes. It is expected to place the plant in operation at an early date, with initial capacity of about 250 tires and like number of tubes per day, giving employment to upward of 300 persons. It is expected to increase this capacity up to 1000 tires daily at a later date. The company was recently incorporated with a capital of \$500,000.

Baltimore

BALTIMORE, July 14.

The American Cellulose & Chemical Mfg. Co., Ltd., 681 Fifth Avenue, New York, is considering plans for an addition to its plant at Amcelle, Md., to cost with equipment in excess of \$1,000,000. The new plant, it is said, will employ 1000 persons for initial operations.

The Lessman Loader Co., Wilmington, Del., has been incorporated with a capital of \$300,000 by E. E. Aberlee and J. H. Dowdell, Wilmington, to manufacture loading and hoisting machinery.

The du Pont Motor Mfg. Co., Dover, Del., recently incorporated with a capital of \$100,000, is perfecting plans for the manufacture of automobiles of four-cylinder type. Temporary offices have been established at 904 Market Street, Wilmington. E. Paul du Pont is president, and Arthur M. Marris is vice-president and general manager.

The Adelpia Garage Co., 2325 Calow Avenue, Baltimore, will build a one-story service works and repair shop, 120 x 240 ft.

Plans to open an automobile repair shop at 962 North Howard Street, Baltimore, have been made by J. H. O'Donovan.

Price Brothers, Frederick, Md., have awarded a contract for a one-story foundry and machine shop, 37 x 160 ft., to L. C. Culler, Frederick.

C. Billups Son & Co., Norfolk, Va., plans to construct a foundry and wants prices on equipment.

The Cambridge Iron & Metal Co., 2032 Aliceanna Street, Baltimore, will install 50 hp. in motors.

The James Robertson Mfg. Co., Baltimore, manufacturer of pipe, fittings, plumbing supplies, etc., has acquired property, 40 x 130 ft., on Hopkins Place, near Lombard Street, near its present plant, for proposed expansion. The consideration given is said to be \$75,000.

The rebuilding work at the plant of the Universal Plow Co., Florence, S. C., following the recent fire loss, will consist of a one-story brick foundry, 60 x 65 ft. H. A. Smith is manager.

The Bureau of Yards and Docks, Navy Department, Washington, has perfected plans for a power plant at the Government works at Indian Head, Md. A low bid has been received from the Boyle Robertson Construction Co., Evans Building, Washington, at \$210,290, for the erection of the proposed industrial plant at Hampton Roads, Va. This plant will consist of about 7 one-story buildings, varying from 54 x 152 ft., to 50 x 58 ft.

The Crowell Auto Co., South Boston, Va., is having plans prepared for a one-story service works and repair shop, 122 x 130 ft.

The Mobile Tractor Co., Mobile, Ala., recently incorporated with a capital of \$1,000,000, has purchased a local building, 125 x 225 ft., on a site 300 x 470 ft., for its proposed works for the manufacture of motor tractors. It is planned to develop a capacity of about 3000 per year, with new machinery and equipment to be purchased estimated to cost in excess of \$50,000. The building acquired will be remodeled and improved to accommodate the new plant. F. J. Ryan, City Bank Building, is president.

The Chickasaw Shipbuilding Co., Mobile, Ala., has laid the keel for the construction of the third steel vessel at its local shipyard, to be of 9600 tons capacity. The plant is now being operated at maximum output with full force of employees, and plans are under way to lay two more keels within the next two months. George C. Crawford, Birmingham, is president.

Chicago

CHICAGO, July 14.

A few dealers report a falling off in orders, but business in general continues satisfactory. One representative of a general line of tools booked orders in the first eleven days of this month equivalent to 75 per cent of the business he had done in the entire month of June. The demand for lathes and punch presses is particularly active. A seller of heavy punch presses whose sale amounted to only \$6,000 in December, 1918, did \$176,000 worth of business in June, or 50 per cent more than in the same month a year ago. The Studebaker Corporation's purchases of heavy punch presses for its South Bend, Ind., plant are reported to have aggregated \$500,000. A Chicago representative of an Eastern lathe manufacturer recently received an order for five machines. An Aurora, Ill., firm has purchased one 24-in. x 24-ft. and one 24-in. x 12 ft. lathe.

Several orders have been received from the South and

from abroad. One Southern company has purchased two 19-in. and two 25-in. lathes, two turret lathes and a 5-ft. radial drill. An automobile accessory manufacturer of Fort Worth, Tex., has bought one combination reamer, tap and facing tool, one bench drill and one Dumore grinding machine. Armour & Co. has ordered a milling machine, an engine lathe, a punch press, an electric grinding machine and a drilling machine for export to Brazil. An English firm has purchased two gear-cutting machines from a local dealer.

The Isko Co., manufacturer of ice machinery, Chicago, has bought a number of grinding machines and is expected to place additional equipment. Montgomery, Ward & Co. has taken prices on a list of tools for its new gas engine plant at Springfield, Ill. The Duplex Printing Press Co., which has commenced the construction of an addition to its plant at Battle Creek, Mich., has already purchased an electric crane and will place orders for machine tools later. The Chicago Board of Education has issued a list of equipment, the only machine tools called for being a grinding machine and a Marvel saw.

C. Dantzer Sorenson, Copenhagen, Denmark, desires to get in touch with machine tool manufacturers in this country. Mr. Sorenson can be reached care of Messrs. Holm & Rahr, 3 Mikkel Bryggersgade, Copenhagen.

The Federal Machinery Sales Co., Chicago, which heretofore has represented the Monarch Machine Tool Co., now has the exclusive agency for the Sidney lathes in Chicago territory. The Milwaukee office of the Federal Machinery Sales Co. secured the Sidney agency for Wisconsin early in June.

The North Western Fuel Co. is constructing a dock at Duluth, Minn., 500 ft. wide x 1550 ft. long. It will be equipped with a Brownhoist crane with a span of 350 ft.

Freyn, Brassert & Co., Chicago, have a contract for the design and construction of a \$500,000 plant for the Grip Nut Co. on a site on the south side of Fifty-ninth Street between Western Avenue and the Baltimore & Ohio Chicago Terminal Railroad. The first unit, a reinforced concrete structure, 100 x 750 ft., is now under construction.

Albert Pick & Co., manufacturers of cooking apparatus and metal novelties, 212 West Randolph Street, Chicago, have awarded a contract to the E. W. Sproul Co., Chicago, for an addition to cost \$600,000.

Contracts have been awarded for a two-story factory, 288 x 313 ft., for the Library Bureau, manufacturer of filing devices, office equipment and supplies, Chicago. The plant will cost about \$200,000 and will be located at North Homan and Potomac avenues.

P. Ballman has let contracts for a one-story machine shop, 65 x 140 ft., at 8701-8707 Burley Avenue, Chicago, estimated to cost \$7,000.

The Whitman & Barnes Mfg. Co., Chicago, has awarded contracts for a one-story forge shop, 100 x 500 ft., at 120th and Morgan streets, at a cost of \$250,000.

The Chicago Gear Co., 2823 Fulton Street, Chicago, has let contracts for a one-story plant, 70 x 146 ft., to cost \$10,000.

A warehouse of the Edison Electric Appliance Co., 2230 Ogden Avenue, Chicago, was destroyed by fire on July 6, incurring an estimated loss of \$75,000.

The Westerline-Campbell Co., manufacturer of ice machinery, 26 North Clinton Street, Chicago, has purchased property in Cornelia avenue, west of Seminary avenue, and plans to erect a one and two-story plant to cost \$35,000.

The Butler Street Foundry & Iron Works, Chicago, has let a contract for a plant addition, 25 x 125 ft., to cost \$20,000.

The Apex Appliance Co., manufacturer of washing machines, 3231 West Thirtieth Street, Chicago, is having plans drawn for a five-story plant, 100 x 300 ft., to cost \$275,000.

The Ilg Ventilating Co., 154 Whiting Street, Chicago, is preparing to construct a plant consisting of a four-story main structure and several smaller buildings, to cost \$700,000.

The Canedy Otto Mfg. Co., Chicago Heights, Ill., has let a contract for a machine shop addition to cost \$20,000.

The Western Casket Hardware Co., Elgin, Ill., has awarded a contract for a four-story plant, 51 x 53 ft., to cost \$20,000.

The Sterling Stamping Co., Sterling, Ill., has been organized by S. L. and F. X. Maier, with an initial capital stock of \$12,000.

The Cyclone Fence Co., Waukegan, Ill., has awarded contract for a \$35,000 addition, adding about 20,000 sq. ft. floor space.

The Reardon Co., 202 West Jefferson Street, Peoria, Ill., has been incorporated with a capital stock of \$25,000, to manufacture automobile accessories.

The Ogren Automobile Co. has practically completed ar-

rangements for the purchase of from six to ten acres in Belvidere, Ill., as a site for an automobile manufacturing plant. It is planned to erect a structure immediately affording 30,000 sq. ft. of floor space.

The Rockford Milling Machine Co., Rockford, Ill., has increased its capital stock from \$200,000 to \$1,450,000.

The Pana Engine & Mfg. Co., Pana, Ill., has been incorporated with \$50,000 capital stock to manufacture steam engines and machinery.

The Crawford Tool & Mfg. Co., 4810 West Twenty-second Street, Chicago, has broken ground for a two-story machine shop, 28 x 120 ft., to cost \$20,000.

The Chrobaltic Tool Co., Chicago, has been incorporated with a capital stock of \$100,000 by Harold Beacom, R. S. Tuthill and M. J. Atkinson, to manufacture tools and mechanical devices.

The American Wire Fabrics Co., 208 South La Salle Street, Chicago, is completing plans for its proposed works at Blue Island, Ill., and will soon call for bids. The plant is estimated to cost close to \$1,000,000.

The Sheffield Steel & Iron Co., Chicago, has been incorporated with a capital stock of \$10,000 by Richard H. Hallsted, Horace C. A. Mitchell and George W. Gordon, to manufacture iron and steel products.

The Apex Appliance Co., Chicago, has increased its capital stock from \$100,000 to \$500,000.

The Knight Light & Soda Fountain Co., 341 West Chicago Avenue, Chicago, manufacturer of soda fountains, equipment, etc., is taking bids for a one and three-story plant, 163 x 198 ft., and 77 x 210 ft., respectively, at Shubert and Kildare streets.

The North Chicago Hardware Co., North Chicago, Ill., has construction work well under way for a two-story and basement addition, 80 x 200 ft., to cost \$75,000.

The Open Hearth Furnace Co., Chicago, has been incorporated in Delaware with capital stock of \$100,000 by L. L. and B. F. Cowan, and P. Zals, Chicago, to manufacture furnace equipment.

The Kansas Gas & Electric Co., Kansas City, Mo., an interest of the Electric Bond & Share Co., 71 Broadway, New York, is having plans drawn for a three-story addition to its electric power plant at Wichita, Kan., to cost \$250,000.

The Des Moines Exide Battery & Supply Co., Des Moines, Iowa, is constructing a two-story plant, 66 x 84 ft., at Thirtieth Street and Grand Avenue.

The Fordcord Rubber Co., has been incorporated with \$2,000,000 capital stock to manufacture a special tire for Ford automobiles. A plant will be constructed at Council Bluffs, Iowa. James A. Gilmore, for several years secretary of the Standard Oil Co. of Nebraska, is president; Max Geisler, Omaha, Neb., is vice-president; George Wright, attorney, Council Bluffs, is secretary, and Frank True, city treasurer of Council Bluffs, is treasurer.

The Cuthbert Co., Minneapolis, Minn., has been incorporated with \$100,000 capital stock to manufacture grain grading, testing, cleaning and weighing machinery. The incorporators include C. W. Taylor, Duluth, Minn.; and O. L. Nelson and K. J. McLennan, Minneapolis.

The Bailor Plow Mfg. Co., Atchison, Kan., is constructing a factory office building, and will soon commence the erection of an assembly room, 80 x 150 ft.

Cleveland

CLEVELAND, July 15.

New machine-tool business continues to come out in very good volume. Orders are now coming from more diversified industries than a few weeks ago when the activity was largely confined to the automobile field. The tractor industry, which has not done much buying for some time, is now placing some orders for additional equipment. A feature of the market at present is that buyers are in a hurry for machines and usually place orders with little delay after sending out their inquiries. The activity at present is largely in the smaller types of machines. There is a very active demand for small screw machines, and considerable call has developed recently for punch presses.

The Drew Electric & Mfg. Co., Indianapolis, manufacturer of overhead fixtures, for electric trolley wire, has purchased a 2-acre site at Collamer Avenue and the Nickel Plate Railroad, East Cleveland, Ohio, where it will shortly begin the erection of a plant, a machine shop and brass foundry to cost \$50,000. The contract has been placed with the Austin Co., Cleveland. James H. Drew is president.

The Atlantic Machine & Mfg. Co., Cleveland, has increased its capital stock from \$30,000 to \$150,000.

Benjamin Moore & Co., Cleveland, will build a plant at

East Seventy-first Street and Grant Avenue for the manufacture of paints and varnishes. Contracts have been awarded to the George Rutherford Co. for six units at a cost of \$200,000. These will include a three-story office building, 50 x 50 ft.; a two-story, raw material storage building, 100 x 120 ft.; a four-story manufacturing building, 60 x 100 ft.; a finished-product warehouse, 120 x 255 ft.; a boiler house and office building.

The plant of the Crescent Brass Mfg. Co., Cleveland, was burned last week, fire causing a loss estimated at \$70,000.

Further enlargements to the plant of the Chandler Motor Car Co., Cleveland, are announced. These will include the adding of three stories to a one-story structure, 80 x 400 ft., and an addition, 60 x 440 ft., to the assembly hall and a five-story administrative building, 42 x 95 ft.

The National Copper & Smelting Co., Cleveland, has acquired a 3-acre site on Babbitt Road for a plant.

The Sommer-Adams Co., Cleveland, maker of dies, jigs and fixtures, is enlarging its plant by the erection of a one-story addition, 40 x 160 ft.

It is announced from Akron, Ohio, that the Goodyear Tire & Rubber Co. and the Associated Pacific Cotton Mills Co. has purchased a 400-acre site in Los Angeles, Cal., where a branch plant will be built.

A plant to be erected by the B. F. Goodrich Rubber Co., Akron, will be largest of 84 buildings that now compose the Goodrich plant. It will be 170 x 300 ft., eight stories, and will be used for mill and compound room and warehouse.

The Canton Stamping & Enameling Co., Canton, Ohio, will erect a one-story building providing 45,000 sq. ft. of floor space.

The Acme Level & Mfg. Co., Toledo, maker of spirit levels, merchants' display racks and tools, will move its plant to Archbold, Ohio, where it will erect a two-story plant, 38 x 100 ft.

The United Roll & Foundry Co., Ravenna, Ohio, will shortly begin the erection of a building providing 4000 sq. ft. of floor space and contemplates the erection of a building, 90 x 240 ft., to be occupied by a foundry and machine shop. The company will specialize in the manufacture of rolling mill equipment and rubber-working machinery.

The American Malleable Castings Co., Marion, Ohio, has taken bids for a foundry addition, 60 x 70 ft.

The Bellefontaine Bridge & Steel Co., Bellefontaine, Ohio, has increased its capital stock from \$150,000 to \$300,000 to take care of its growing business. Charles S. Hockett has been elected a director to succeed George R. Worrell, resigned.

The Fostoria Tool & Machine Co., Fostoria, Ohio, has been organized with a capital stock of \$100,000 and will establish a plant in the building formerly occupied by the Allen Motor Co.

The Sunray Stove Co., Delaware, Ohio, will place contract shortly for two plant additions, 80 x 100 ft. and 43 x 95 ft., two stories.

It is announced from Delaware, Ohio, that the Rainbow Tire & Rubber Co. will erect a two-story plant, 100 x 300 ft., for the manufacture of automobile tubes.

It is reported from Troy, Ohio, that the Star Foundry Co., of that city, will erect additions.

The Bryan Pattern Machine Co., Bryan, Ohio, will build an extension.

Cincinnati

CINCINNATI, July 14.

There has been no general movement toward advancing prices on machine tools, but many firms do not see how this can be avoided. The cost of castings is much more than it was three months ago, and the recent adoption of the 48-hr. week, without reducing wages, means an approximate increase in labor of 10 per cent and also the same percentage in decreased production. Information has been received that a few shaping machine makers in other parts of the country have already taken steps to mark up their prices.

Orders from South America for machine tools are on the increase. A number of shaping machines were recently bought through exporters for shipment to the east coast, and it is worthy of notice that these machines are not for railroad shops. A South American importer advises a local manufacturer that the war has stimulated light manufacturing to a considerable extent and that there is also a steadily increasing demand for machine tools from small shops engaged in repairing and rebuilding automobiles. An improvement is noted in business from Spain, and the Scandinavian countries are also steady customers for machine-tool makers.

The domestic demand is somewhat spotty. No large lists are being bought on, but the steady stream of single-tool orders from all parts of the country is taking care of the present output of different shops. No stocks are now being accumulated.

A scarcity of skilled labor exists, as the automobile industry has drawn a number of men back to their former jobs that were vacated on account of the war.

The John Van Range Co., Cincinnati, stove and range maker, has leased a building on Third Street that will enable it to increase its capacity. The company's main plant is at Broadway and Fifth Street.

The Trailmobile Co., Cincinnati, is pushing work on its new plant in Oakley, a suburb, and expects to have it ready for occupancy before winter.

The Hamilton Machine Tool Co., Hamilton, Ohio, has taken out permit for a small addition that will be used as a smithshop.

The municipality of Lebanon, Ohio, has voted a bond issue of \$120,000 for a new electric lighting plant.

The Dayton Engineering Laboratories Co., Dayton, Ohio, has had plans prepared for an addition to its plant estimated to cost \$250,000.

The Air City Garage & Tire Co., Dayton, Ohio, has commenced work on a three-story building at Fifth and Perry streets. A small repair shop will be provided.

The Maxwell Motor Car Co., Dayton, Ohio, has taken out permit for the erection of three core-oven sheds adjoining its foundry.

The Hartman Radiator Service, Hamilton, Ohio, is a new firm formed by O. L. and Richard B. Hartman. A shop is being fitted up at 320 Court Street for the building of automobile fenders and repairing and installing automobile radiators.

The Wagner Mfg. Co., Sidney, Ohio, maker of aluminum ware, has let contract for an addition, 80 x 200 ft., three stories, of concrete and steel.

The Henderson Tire & Rubber Co., Columbus, Ohio, has decided to increase the size of its plant now under construction.

The Hyatt Ignition Co., Columbus, Ohio, has been incorporated with \$30,000 capital stock by Samuel W. Hyatt and others. Nothing is known as to manufacturing plans.

The Lancaster Mfg. Co., Lancaster, Ohio, has been incorporated with \$120,000 capital stock by Fred W. Getz and others. It succeeds the Martens Mfg. Co., manufacturer and dealer in automobile accessories.

Milwaukee

MILWAUKEE, July 14.

There appears to be less hesitancy to proceed with shop extensions and new works than at any time since the close of the war and some important machine-shop and foundry construction is developing. Milling machine makers keep comfortably busy with a steady run of orders, which for the most part are of small size but of large number. The Central Western states furnish the bulk of this demand. Eastern buying is of small proportions, and export business so far has remained closely confined by reason of natural as well as artificial limitations on foreign trade.

The labor situation is regarded as fairly satisfactory. There is a shortage of skilled workers, and common labor is by no means plentiful, and the only class in which there seems to be an ample supply is the so-called semi-skilled workers, who are slow in getting placed because they cannot be suited easily. No labor difficulties of a serious nature have come to the surface, and disputes when they arise generally are settled in a short time.

The Samson Tractor Co., Janesville, Wis., subsidiary of the General Motors Corporation, is preparing to start work on the third unit of its plant, a foundry, 300 x 500 ft., of brick and steel, requiring about 800 tons of steel. The Worden-Allen Co., Milwaukee, which erected the first unit, is completing work on the second. These embrace machine shops and assembling floors. When the proposed foundry is under way, a steam generating plant, requiring 700 to 750 tons of shapes, will be undertaken. Frank D. Chase, Inc., Chicago, is consulting engineer.

The Briggs & Stratton Co., 1047 Louis Avenue, Milwaukee, manufacturer of automotive equipment, has engaged Cahill & Douglas, 128 Grand Avenue, consulting engineers, to design and equip a steam generating plant. Bids on engines, generators, switchboards, etc., will be taken immediately by the engineers.

The Lawson Airplane Co., Milwaukee, has been incorporated with an authorized capital stock of \$1,000,000 to manufacture aircraft parts and accessories. The incorpora-



The illustrations show the broken 26½-ton cast steel stern frame of the army transport Northern Pacific and the repair weld made by the Metal & Thermit Corporation, 120 Broadway, New York. The whole section of the stern frame was cracked through, the cross-section of the break forming roughly a triangle, each side of which was about 2 ft. in length. The welding of this fracture offered a special problem because the crack occurred in a hollow part of the casting just above a solid heavy portion. The wall of the casting at the break averaged about 3 in. in thickness.

To provide a place for the thermit steel to enter in bulk and form an amalgamation with the broken parts, a 3-in. gap was cut out at the break with an oxy-acetylene torch. A total of 67 lb. of wax was required for the fracture and 1400 lb. of thermit was used.

tors are Alfred W. Lawson, Gustav Kleemann and Lee Wallace. Mr. Lawson formerly manufactured aeroplanes at Green Bay, Wis., but for the past five or six months has been doing experimental and construction work in Milwaukee, contracting with existing industries for production of parts. Later it is intended to build and equip a complete factory in Milwaukee.

The State of Wisconsin is establishing a factory in connection with the State Prison at Waupun for the manufacture of all automobile license tags by convict labor. Stamping, embossing and punching tools are now being purchased. The estimated requirement of steel sheets for the supply of license tags for 1920 is 100 tons. M. J. Tappins, State Capital, Madison, is secretary of the State Board of Control.

The Malleable Iron Range Co., Beaver Dam, Wis., has plans by Lockwood, Greene & Co., consulting engineers, Chicago, for an annealing shop, one and two stories, 50 x 115 ft., to cost \$30,000. Bids are now being taken.

The Kidwell Boiler & Engineering Co., Milwaukee, which was incorporated several months ago with an authorized capital stock of \$1,000,000, has completed its organization by the election of these officers: President, John F. Jackson; vice-president, R. W. Campbell; secretary and treasurer, Stuart H. Markham, First National Bank Building, Milwaukee; general manager, Dr. Edgar Kidwell. The company intends to manufacture high-pressure water-tube steam boilers for land and marine use in connection with triple and quadruple expansion steam turbines. Arrangements are being made for the establishment of a plant in Milwaukee, but details are not ready. Mr. Jackson formerly was vice-president Wisconsin Bridge & Iron Co., Milwaukee.

The Northern Casket Co., Fond du Lac, Wis., will build a three-story factory addition, 100 x 200 ft.; a new power plant and boiler house, 80 x 80 ft., with a concrete stack, and a private garage and machine shop, 40 x 80 ft., the improvements to cost \$100,000. New steam generating equipment will be required, the factory heretofore having been operated with purchased current. Construction will begin Sept. 15. William Mauthe is president and general manager.

The Vim Tractor Co., Schleisingsville, Wis., has acquired 7½ acres adjoining to provide sites for future extensions, the first to be made before next year. The estimated cost of building and equipment is \$50,000. Tentative plans have been prepared. The Vim company is negotiating for the purchase of two established factories making cultivators and seeders, with the intention of adding these lines as departments of regular production. Charles D. Storck is president.

The Oshkosh Trunk Co., Oshkosh, Wis., has awarded a contract to C. R. Meyer & Sons Co., local contractors, for a three-story factory addition, 50 x 240 ft.; a three-story shop building, 50 x 120 ft., and a power plant addition, 37 x 87 ft. Some new metal-working machinery and considerable woodworking equipment is being purchased. The improvements will cost \$100,000.

The Stoughton Wagon Works, Stoughton, Wis., will build a one-story factory addition, 45 x 100 ft., with saw-tooth roof, for the use of the manure spreader manufacturing department. Most of the equipment has been purchased. F. J. Veal is president.

The R. L. Kenyon Co., Waukesha, Wis., manufacturer of cots, portable buildings, etc., has engaged Cabill & Douglas, consulting engineers, 128 Grand Avenue, Milwaukee, to prepare tentative specifications and estimates for a steam generating plant.

The Hamilton-Beach Mfg. Co., Racine, Wis., manufacturer of motor-driven devices, will erect a four-story additional building, 60 x 350 ft., from plans prepared by A. L. Flegel, local architect. Labor difficulties have been adjusted and the company will not build a new plant at Syracuse, N. Y., as contemplated a short time ago. Fred J. Osus is president and general manager.

Burns Brewer, Janesville, Wis., will build a two-story shop addition, 34 x 45 ft., to the Park Garage, at an estimated cost of \$20,000, including new machinery.

The Racine Mfg. Co., Racine, Wis., manufacturer of automobile bodies, has plans for a two-story brick and concrete factory addition, 45 x 120 ft., to cost \$50,000. E. B. Funston is architect and will take bids after July 20.

James E. Drummond, 221 East Milwaukee Street, Janesville, Wis., will spend \$15,000 in enlarging and installing new equipment in his public garage and repair shop. The addition will be 66 x 85 ft., two stories.

George Kamm, Racine, Wis., has broken ground for a garage and machine shop, 58 x 122 ft., of brick, to cost \$20,000.

The Macomber & Whyte Rope Co., Kenosha, Wis., manufacturer of wire rope, cable, etc., is contemplating important enlargement of its capacity about Oct. 1. A building at Coal City, Ill., now leased by a subsidiary of Sears, Roebuck & Co., Chicago, will become available at that time, and probably will be equipped for cable manufacture. George S. Whyte is president.

The West Bend Aluminum Co., West Bend, Wis., has made a bond issue of \$200,000 for the purchase of equipment and machinery for a factory addition recently completed; to construct homes for workers, and otherwise finance the expansion of the business. The First National Bank of West Bend has been made trustee.

Stockholders of the Reliance Motor Truck Co., Appleton, Wis., have ratified the action of directors in increasing the capital stock from \$500,000 to \$1,000,000 to provide a four-story manufacturing addition costing \$125,000 and adequate working funds. The company manufactures motor trucks and truck axles and expects to break ground for the building Aug. 15.

Pittsburgh

PITTSBURGH, July 14.

Considerable electrical and mechanical equipment will be required for the proposed extensions to the municipal water supply system and sewerage system at Pittsburgh. At a special election, July 8, bonds to the amount of \$1,401,000 and \$1,341,000 were voted for this work, in order noted. The Board of Works will be in charge.

The Universal Rubber Co., New Castle, Pa., will build at Zelenople, Pa., at a cost of about \$300,000, a plant for the manufacture of automobile tires. J. D. Pophan is president.

The Atlantic Refining Co., Pittsburgh, has filed plans for a brick and concrete boiler plant on Butler Street, near Fifty-seventh Street, to cost about \$25,000.

The Duquesne Light Co., Pittsburgh, has arranged for a bond issue of \$25,000,000 for additional working capital and for construction work in connection with its Cheswick power plant, erection of which is now under way. This

plant will have a generating capacity of about 60,000 kw., to be increased later as required. The company is also planning improvements at its Brunot Island power plant, in accordance with agreement with the city, to include the installation of new equipment, with increased capacity in boiler installation, superheaters, feed-water heaters and other apparatus.

The Wierton Steel Co., Wierton, W. Va., has disposed of a bond issue aggregating \$5,000,000, secured by a mortgage, to provide for improvements and extensions at its plant.

The Charlestown Light & Heat Co., Charlestown, W. Va., has been incorporated with a capital of \$50,000 by A. Howard Ritter, W. H. Comfort and C. S. Newhall, all of Philadelphia, Pa., to establish and operate an electric power plant for local service.

The Virginian Rubber Co., Charleston, W. Va., has been incorporated with a capital of \$1,200,000 by Houston G. Young, A. A. Lilly and W. D. Guyer, to manufacture automobile tires, etc.

The State Board of Control, Charleston, W. Va., is having plans prepared for a one-story and basement power plant at the State institution, Institute, W. Va.

The Lightning Coupler Link Co., Pittsburgh, has been incorporated with a capital stock of \$5,000 by T. C. Kremer, 1022 Canal Street, Sharpsburg, Pa.; J. M. Bowden, 308 Eastern Avenue, Aspinwall, Pa.; F. W. Pilgrim, 211 Clifton Avenue, Sharpsburg, to manufacture iron, couplings, machinery, etc.

The American Instrument Works, Pittsburgh, Pa., has been incorporated by Adolph Lindemann, George Hiller and Ernst A. Shunk to manufacture surgical, drawing, surveying and scientific instruments. The capital stock is \$25,000.

The Keystone Mechanical Products Co., Pittsburgh, has filed notice of an increase in capital stock from \$5,000 to \$25,000. Robert I. Jones is secretary.

The Duquesne Electric & Mfg. Co., Pittsburgh, will increase its capital stock from \$50,000 to \$150,000. I. M. Casey is secretary.

The recently incorporated Slag Rock Machine Co., Pittsburgh, has filed notice of an increase in capital stock from \$5,000 to \$150,000. D. Lee McConaughy is secretary of the board of directors. Other directors are A. M. Replogle and George F. Murphy.

The Hydraulic Drawn Forging Co., Pittsburgh, has filed notice of an increase in capital stock from \$500,000 to \$6,000,000. J. G. Bassett is secretary.

A. C. Love, Huntington, W. Va., is seeking prices on milling machines and 18 or 20-inch back-geared engine lathes.

The Standard Wheel Co., Terre Haute, Ind., is considering the installation of additional equipment at its branch works at Centerville, Tenn., to develop a department for the production of rims, strips, etc., for automobile and wagon wheels, including parts manufacture. The plant has been specializing in the production of spokes.

The William J. Oliver Mfg. Co., Knoxville, Tenn., manufacturer of plows, agricultural implements, etc., is planning a new one-story foundry to cost about \$30,000. An electric furnace will be installed. William J. Oliver is president.

Indianapolis

INDIANAPOLIS, July 14.

The Miller Tire & Rubber Co., Anderson, has purchased additional ground for extensions to its plant.

The Plymouth Electric Light & Power Co., Plymouth, Ind., has increased its capital stock \$20,000, making the total \$220,000.

The Knull Motor Co., Pierceton, Ind., has increased its capital stock from \$30,000 to \$60,000.

The McFarland-Hyde Co., Chicago, manufacturer of steel products, has bought the Planett factory building in Laporte, Ind., and will occupy it.

The Salamonina Light & Power Co., Salamonina, Ind., has been incorporated with \$10,000 capital stock by Peter Berger, H. E. Bartling and Peter B. Kelly.

The Vacuum Ice Machine Co., Logansport, Ind., has increased its capital stock from \$75,000 to \$200,000.

The Mid-West Box Co., Anderson, will spend \$75,000 for an addition to its plant including machinery.

The Muncie Machine Tool & Supply Co., Muncie, Ind., has been incorporated with \$50,000 capital stock by J. L. Moore, Max Zeigler and A. W. Killin.

The Ben Schroeder Co., Madison, Ind., has been incorporated with \$10,000 capital stock by Leo B. John P. and Charles W. Schroeder to manufacture wood and iron articles.

The Collapsible Auto Rim Adjustable Tool Mfg. Co., Indianapolis, has been incorporated with \$100,000 capital stock by Edward P. Bauman, Dave Yover and Paul P. Scharf, to manufacture tools.

The Wayne Belting and Supply Co., Fort Wayne, Ind., has increased its capital stock from \$25,000 to \$75,000.

The American Dehydrating Co. has been incorporated at Gary, Ind., with \$1,000,000 capital stock by Horace S. Norton, Ingwald Moe, Chester E. Wirt, William F. Hodges and Oscar T. Gregory, to manufacture dehydrating machinery.

The capital stock of the Root & Van Dervoort Engineering Co., East Moline, Ill., manufacturer of the Moline-Knight automobile and the R & V automobile and tractor, has been increased to \$7,500,000, from \$1,346,200.

The Standard Oil Co. has awarded contracts for a one-story machine shop, 80 x 120 ft., at South Bend, Ind., at an estimated cost of \$75,000.

The Majestic Tire & Rubber Co., Indianapolis, Ind., has commenced the manufacture of cord tires in a building at Cruse and Daly streets, formerly occupied by the Home Brewing Co. The company was recently organized with \$250,000 capital stock. The officers are R. H. Syfers, president; E. B. Oscars, vice-president and sales manager; and O. C. Pantall, secretary and treasurer.

The Elkhart Bridge & Iron Co., Elkhart, Ind., has increased its common stock from \$10,000 to \$50,000.

St. Louis

ST. LOUIS, July 14.

The Oil City Iron Works, Shreveport, La., will enlarge its plant, having increased its capital stock by \$125,000 for the purpose.

The Oklahoma Iron Works, Tulsa, Okla., will construct a plant to cost \$500,000, including an electric power plant to cost \$180,000 and machinery to cost \$250,000.

The Great American Refining Co., Tulsa and Jennings, Okla., will equip an oil refinery at Shreveport, La., with 5000 bbl. daily capacity.

The Sinclair Gulf Pipe Line Co. will equip two 8-in. oil pipe lines from Healdton, Okla., to Buckburnett, Tex., and the Cushing, Okla., field.

The Industrial Laboratories Co., Fort Smith, Ark., Otto V. Martin, manager, will equip a plant to manufacture metal drums. It is also in the market for grinding machinery.

The Berg Safety Crank Co., Little Rock, Ark., will equip a \$25,000 plant to manufacture thief-proof locks and other devices for gasoline engines. Joseph C. Berg is president.

The Power Farm Tractor Co., Continental Bank Building, Shreveport, La., capital stock \$1,000,000, will equip a plant for the manufacture of farm tractors. B. S. Braswell is president.

Detroit

DETROIT, July 14.

The Steere Engineering Works, Detroit, and the Owosso Boiler Works, Owosso, Mich., have been consolidated. A new plant will be put up at once in Owosso, and the consolidated company will be known as the Steere Engineering Works. General headquarters will remain in Detroit at the present offices of the Steere corporation, while the latter's machine and boiler shops will be moved to Owosso. J. L. Brandel is president of the present Owosso company.

The Central Products Co., Detroit, incorporated last week with a capital stock of \$10,000, is a new General Motors subsidiary, which will be devoted to the manufacture of essential parts for its trucks and motor cars. The principal incorporators are H. H. Rice, treasurer General Motors Corporation; Henry L. Barton, president Northway Motor & Mfg. Co., and T. S. Merrill, secretary General Motors Corporation.

Ground has been broken in Coldwater, Mich., for the new plant of the Homer Furnace Co. It is expected the plant will be completed this summer.

Plans are under way for a considerable extension of the facilities of the Hayes Motor Truck Wheel Co., St. Johns, Mich., new machinery and equipment having been ordered. Wheels will be made with steel felloes instead of wood.

The D'Arcy Spring Co., Kalamazoo, Mich., is erecting an addition, two stories, 190 x 200 ft., which will increase the floor space by 76,000 sq. ft.

The Grand Rapids Brass Co., Grand Rapids, Mich., is building a foundry addition.

The Western Machine Tool Works, Holland, Mich., is constructing an addition to its plant.

The Continental Motors Corporation, Muskegon, Mich., is reclaiming 35 acres of land from Muskegon Lake as a site for an addition to cost \$1,000,000.

The National Castings Co., South Haven, Mich., suffered a loss of about \$10,000 through a conflagration in its plant July 3.

The Hardie Mfg. Co., Hudson, Mich., is constructing a one-story addition to be used as a machine shop.

The Adrian Brass & Aluminum Casting Co., Adrian, Mich., will soon commence operations in a building which has been remodeled for foundry purposes.

Fisher Brothers, architects, Pontiac, Mich., have prepared plans for a one-story machine shop, 40 x 163 ft., to cost \$15,000. The name of the owner has been withheld.

The Fisher Body Co., Piquette and Oakland Avenues, Detroit, manufacturer of automobile bodies, is having plans prepared for an addition to cost in excess of \$500,000. F. J. Fisher is president.

Plans for a one-story boiler plant have been prepared by the Luce Furniture Co., Grand Rapids, Mich., for works service.

The Maxwell Motors, Inc., Highland Park, Detroit, is having preliminary plans prepared for its proposed plant in the vicinity of its present works. The new plant will consist of eleven complete units, and it is said will cost about \$5,000,000, including equipment. Smith, Hinchman & Gryllis, Washington Arcade, Detroit, are the architects.

The Columbia Motors Co., 1256 East Jefferson Street, Detroit, manufacturer of automobiles, has acquired local property for its proposed plant. Preliminary plans are under way. J. G. Bayerline is president.

The Aerial Cutlery Co., 114 Hosmer Street, Marinette, Mich., has broken ground for a two-story addition, 40 x 93 ft., to cost \$15,000. The company, specializing in fine cutlery goods, is operated by Jaeger Brothers.

The Benton Harbor Malleable Foundry, Benton Harbor, Mich., has had plans prepared for a two-story building, 60 x 85 ft., to cost \$35,000.

The Western Gear Mfg. Co., Scotten Avenue, Detroit, has completed plans for the proposed one-story addition, 50 x 90 ft.

Texas

AUSTIN, TEX., July 12.

The Texas-Mexico Pipe Line & Refining Co. plans to build a large oil refinery at Port Aransas and construct a pipe line from the Cotton County oilfields of Oklahoma and the central north Texas fields to that place, a distance of about 400 miles. Robert Galbreath, Tulsa, Okla., is president.

Byron Miller and Clarence Miller, Dallas, have awarded contract for a cotton mill at Waco to the W. C. Hedrick Construction Co., Dallas, at a cost of about \$750,000. It will give employment to over 500 operatives.

The El Paso Petroleum Co. has purchased 40 acres at El Paso as site for an oil refinery.

The Chevrolet Motor Co. of Texas, Fort Worth, will build an addition to its assembling plant to cost \$150,000.

The Union National Oil & Refining Co. has purchased a 40-acre tract at Cisco for a refinery of 5000 bbl. daily capacity.

The Stroud Mfg. Association of San Antonio has purchased a 50-acre tract for a plant for the manufacture of automobiles, tractors and trucks. Sam W. Stroud, Stroud, Okla., is president.

The Contractors' Machine & Supply Co., Wichita Falls, has been incorporated with a capital stock of \$300,000 by C. J. Lurie, R. D. Crawford and H. R. McClintock.

The Reed Roller Bit Co., Houston, has been incorporated with a capital stock of \$250,000 by C. E. Reed, J. H. Greshey and Niels Esperson.

The Kibbe Tractor & Implement Co., Dallas, has been incorporated with a capital stock of \$50,000 by Louis G. Kibbe and others.

The Pacific Northwest

SEATTLE, July 8.

The matter of car supply in the Northwest is again becoming a serious problem. The unusual increases in the lumber shipments from the North Pacific Coast to the Middle West, and even to the East, coupled with the beginning of the movement of one of the greatest wheat crops in the history of the country, threaten the car supply to a serious degree.

Heavily restricted production of lumber is predicted for

the months of July and August, as the mills require extensive and immediate repairs. Many will close down. The demand for new and second-hand sawmill and logging equipment is heavy, and dealers report stocks being cleaned up.

Portland shipbuilders have received information that the Shipping Board has been supplied with funds to carry on its full program. This relieves the situation in Portland, and it is believed that some of the yards will follow the example of the Skinner & Eddy Corporation, Seattle, and soon begin to build on their own account. A source of demand for road-building machinery is expected from roads which are planned for both Oregon and Washington.

The St. Helens Dock & Terminal Co., St. Helens, Ore., has been organized with a capital stock of \$200,000. It proposes to build near Sauvis Island a landing dock equipped with a traveling locomotive crane, etc.

It is announced that the Eagle Flouring Mills Co., Portland, will erect a mill and elevator at the new St. Johns municipal terminal at a cost of \$1,000,000.

The sawmill of the Standard Box & Lumber Co., Scofield, burned with a loss of \$225,000, will be rebuilt.

The Iceland Refrigerator Co., Vancouver, Wash., has purchased the property of the Central Mfg. Co. and will manufacture refrigerators. New equipment will be installed.

The Asbestomine Paint Co., Seattle, has purchased a site at 406 East Marginal Way for a paint factory.

The Johnson Auto Signal Co., Vancouver, Wash., will establish a plant for the manufacture of automobile accessories.

It is reported that negotiations are about to be closed for the purchase of the Albina Engine & Machine Works's shipbuilding plant in Portland by the Foundation Co. Representatives of the French Government have been inspecting the plant. It is stated that if the deal is consummated 10 steel ships will be built there for French interests. Bayly Hipkins is Pacific Coast manager of the Foundation Co.

The Davis Car Co., Seattle, plans the construction of an automobile factory, one-story, 105 x 160 ft., to cost \$25,000.

The Flathead Valley Electric Co., Ronan, Mont., will install several electric light and power plants in the Flathead Valley. Andrew Anderson, Plains, Mont., is president.

The plant of the Surrier Lumber Co., Weiser, Idaho, was destroyed by fire recently with a reported loss of \$45,000.

The sawmill of the Bunker Hill & Sullivan Mining Co., Kellogg, Idaho, was destroyed by fire recently, with a loss estimated over \$50,000. Stanley Easton is manager.

The Grays Harbor Motorship Corporation, Aberdeen, Wash., has entered shipbuilding for private account, and has laid the keels for two new five-masted barkentines for lumber carriers.

Wentworth & Irwin, Portland, truck and automobile body builders, have received contract from the Government for building bodies for mail trucks, representing about \$500,000. It will immediately enlarge its shops at Second and Taylor streets and install new equipment.

The Sperry Mills, Spokane, Wash., plans the addition of a four-story cereal plant to cost between \$150,000 and \$200,000. J. K. Smith is manager.

The Alaska Sulphur Co., Seattle, will construct a refinery at its sulphur plant at Akum Island, Alaska. O. L. Erickson is vice-president.

The Canadian Puget Sound Co.'s sawmill at Victoria has been taken over by W. D. Connor, who will increase the output to 150,000 ft. daily.

The Palmer Lumber & Mfg. Co., Chehalis, Wash., has taken over an abandoned plant and will remodel it to manufacture ready-cut houses. A building to contain the machine shop, 70 x 220 ft., is to be rebuilt and equipment installed.

The Gregory Tire & Rubber Co., Burnaby, B. C., has completed plans for a rubber and tire factory in that city. It will cost \$50,000.

California

LOS ANGELES, July 8.

The City Forge & Spring Works, Main and Hill streets, Santa Monica, Cal., has filed notice of organization to manufacture forgings, springs and other iron and steel specialties. A. A. Generaux, 560 Rose Avenue, Venice; and N. W. Hamilton, Villa and Allen Avenues, Pasadena, head the company.

The Axelson Machine Co., Boyle Avenue and Randolph Street, Los Angeles, has been incorporated with a capital of \$750,000 by C. F. and D. F. Axelson, So. Pasadena; and J. C. Axelson, Alhambra, to manufacture oil well pumping equipment, pump fittings, castings and other machinery.

Canada

TORONTO, July 14.

A slight improvement is noted in the machinery and machine tool market this week and if buying in general were as good as it is in some local instances there would be a large business moving in the Dominion. The western division of the National Railways has put out a list of some 60 machine tools. It is also in the market for drills, taps,reamers and other small tools for the St. Malo shops in Quebec. The strike in the machinery and metal trades is causing considerable inconvenience to the trade and dealers in tools are finding themselves in difficulties when it comes to giving dates as to delivery. Where a special tool is asked for several months are required before delivery can be made. There are rumors, some of them well founded, that a settlement in the strike situation is near, others again say that many of the strikers have left the district to secure work elsewhere.

The Canadian Consolidated Rubber Co., Ltd., has decided to spend immediately \$1,000,000 on its tire plant at Kitchener, Ont., for the purpose of increasing output.

The United Iron Works & Machine Co., Ltd., will remove its head office from Haileybury, Ont., to Toronto.

The St. Raphael's Hydraulic Power Co., St. Raphael, Que., proposes to undertake waterpower development and is asking for quotations on steel and frame pipes of 5.9-in. to a length of 8000 ft. C. Camille Lessard, 1 Jacques Cartier Avenue, Quebec, is engineer.

The Megantic & Stanstead Quarry Co., 145 Bleury Street, Montreal, is in the market for a steam-driven air compressor of about 400 cu. ft. per min. capacity.

James, Loudon & Hertzberg, Excelsior Life Building, Toronto, is asking for prices on a gasoline engine-driven pump, capacity 750 gal. per min.

Bids will be called for the construction of a potash recovery plant at Fort Colborne, Ont., for the Canada Cement Co., 273 Craig Street, West, Montreal, to cost \$150,000. John Cuthbert is assistant superintendent.

The General Motors of Canada, Ltd., has awarded the general contract for a factory at Oshawa, Ont., to cost \$1,000,000, to the Canadian Stewart Co., foot of Cherry Street, Toronto. It will consist of an assembling building, four stories, 40 x 80 ft., of reinforced concrete; shipping building, 50 x 200 ft.; storage building, four stories, 80 x 800 ft.; enameling building, 80 x 300 ft., three stories.

The J. C. Wilson Mfg. Co., Ltd., Belleville, Ont., is in the market for a 6 to 8-ft. vertical boring mill.

The Doheny, Quinlan & Robertson, Ltd., Montreal, has been incorporated with a capital stock of \$2,000,000 by Hugh Doheny, Hugh Quinlan, Angus W. Robertson and others to build railways, power plants, to manufacture machinery, implements, tools, etc.

The Allied Aeroplanes, Ltd., Brantford, Ont., has been incorporated with a capital stock of \$40,000 by John Dowling, Brantford, Ont.; Bryan Dowling and others of Toronto, to manufacture aeroplanes, engines, etc.

The Public Utilities Commission, Simcoe, Ont., proposes to purchase a centrifugal pump for sewage disposal work.

According to information from Ottawa the Dominion Government will place additional contracts for steel ships with the Collingwood Shipbuilding Co., Collingwood, Ont., and the Dominion Shipbuilding Co., Toronto. In addition to these the Government will also place contracts with other builders on the St. Lawrence.

The Manifold Light & Power, Ltd., Winnipeg, has been incorporated with a capital stock of \$100,000 by William M. Shaw, Shirley O. P. Gemmill, Harold St. C. Scarth and others to erect and operate electric light, heat and power plants.

The Lount Engineering Co., Ltd., Winnipeg, has been incorporated with a capital stock of \$60,000 by Charles T. Lount, John P. McArthur, Athol W. Moffat and others to manufacture machinery, implements, etc.

The Lambert Syooker Co., Ltd., Winnipeg, has been incorporated with a capital stock of \$100,000 by Joshua K. Lambert, John Muxlow, James H. Boyd and others to manufacture farm implements, machinery, etc.

Legare Automobiles of St. Hyacinthe, Ltd., St. Hyacinthe, Que., has been incorporated with a capital stock of \$100,000 by J. A. Juneau, J. A. Burret, P. C. Falardeau and others to manufacture automobiles, engines, parts, etc.

The Niagara Wire Weaving Co., Ltd., Niagara Falls, Ont., has been incorporated with a capital stock of \$220,000 by Hamilton Lindsay, Alexander Winton, George H. Brown and others, all of Cleveland, Ohio, to manufacture wire, wire cloth, machinery, tools, etc.

The Standard Computing Scale Co. of Canada, Ltd., Windsor, Ont., has been incorporated with a capital stock of \$10,000 by Joseph M. Bucher, Thomas F. Comerford, Ferdinand P. Goettman and others, all of Detroit, Mich., to manufacture computing scales, machinery, tools, etc.

The Canada Metal Window Co., Ltd., Toronto, has been incorporated with a capital stock of \$50,000 by Edwin G. Long, Bay and Melinda streets; Albert Mearns, Frederick L. Whatley and others to manufacture metal window sashes, shutters, iron and steel products, etc.

NEW TRADE PUBLICATIONS

Gage for Production Inspection.—Coats Machine Tool Co., 108 West Fortieth Street, New York. Catalog. Describes the prestometer, a gage operating on the fluid principle, which is explained as making it possible for the operator to read a variation of one hundred thousandth part of an inch. The device is designed to combine speed with accuracy for the gaging of identical parts made in large quantities. Numerous illustrations are included.

Piston Rings.—Gill Mfg. Co., 351 West Fifty-ninth Street, Chicago. Catalog. A directory of piston rings which the company is prepared to furnish for automobiles, trucks, tractors and other internal combustion engines. Instructions for installing the rings are included.

Welding and Cutting Apparatus.—Bastian-Blessing Co., West Austin Avenue, Chicago. Catalog. Illustrates and describes the company's line of welding and cutting apparatus, which are explained as eliminating flashback and as operating on low combined gas pressures.

Valves and Valve Parts for Tires.—A. Schrader's Son, Inc., 783 Atlantic Avenue, Brooklyn. Catalog. An illustrated price list and data sheet of the company's line of valves, valve parts and patented devices for bicycle, carriage, motorcycle, aeroplane and automobile tires.

Fundamentals of Thread Milling.—Smalley-General Co., ay City, Mich. Leaflet. Explains the construction and operating principles of thread-milling machines.

Air-Operated Tools and Devices.—Hannifin Mfg. Co., Chicago. Catalog. Describes the company's line of air-operated chucks, countershafts, clamping devices, arbor presses, expanding mandrels and vises. The various products are illustrated.

Metal Hose.—Pennsylvania Flexible Metallic Tubing Co., Chicago. Bulletin 52. Portrays and describes the company's flexible bronze hose and clincher couplings for use with steam.

Railroad Equipment.—Whiting Foundry Equipment Co., Harvey, Ill. Catalog 145, 36 pages, 8½ x 11 in. The purpose is to bring before railroad men the advantages and labor-saving features of the company's various railroad specialties, which include locomotive hoists, coach hoists, cranes, transfer tables, turntable tractors and car wheel foundries. The catalog is profusely illustrated.

Boiler Tubes.—Standard Seamless Tube Co., Ambridge, Pa. Booklet. Portrays and explains steps in the process for the manufacture of seamless steel tubing for boilers.

Crowning Pulleys.—Gisholt Machine Co., Madison, Wis. Pamphlet. Illustrates and describes the method of crowning pulleys on one of the company's turret lathes.

Emery Band and Disc Grinder.—T. P. Walls Tool & Supply Co., 75 Walker Street, N. Y. Folder. Concerned with an emery band grinder, also emery band and disc grinders. The machines are pictured and described.

Electric Arc Welding.—U. S. Light & Heat Corporation, Niagara Falls, N. Y. Bulletin 700. Pictures and describes the company's stationary and portable electric arc welding outfits. These machines were described in THE IRON AGE issue of June 12, page 1584.

Measuring Gases and Air.—Cutler-Hammer Mfg. Co., Milwaukee. Booklet, 16 pages, 8½ x 11 in. Explains the value of and methods for the accurate measurement of gases and air in gas, coke oven, steel and chemical plants. Numerous views of Thomas meter installations, with the necessary indicating and recording instruments are included. A number of graphic charts are reproduced.

Indicating Calipers.—Indicating Calipers Co., 506 East Nineteenth Street, N. Y. Folder. Describes an indicating caliper made in two capacities, one of 2-in., with a scale graduated in thousandths of an inch, the other of 3-in., with a scale reading in sixty-fourths of an inch. The calipers are illustrated.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

Per lb.

Bars:

Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price.....	6.10c
Burden's best bar iron, base price.....	6.30c
Swedish bars, base price.....	20.00c

Soft Steel:

$\frac{3}{4}$ to $1\frac{1}{8}$ in., round and square.....	3.37c
1 to 6 in. x $\frac{3}{8}$ to 1 in.....	3.37c
1 to 6 in. x $\frac{1}{4}$ and $\frac{5}{16}$	3.47c

Rods— $\frac{5}{8}$ and $1\frac{1}{16}$	3.42c
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Bands— $1\frac{1}{2}$ to 6 x $\frac{3}{16}$ to No. 8.....	4.07c
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Shapes:

Beams and channels—3 to 15 in.....	3.47c
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Angles:

3 in. x $\frac{1}{4}$ in. and larger.....	3.47c
3 in. x $\frac{3}{16}$ and $\frac{1}{8}$ in.....	3.72c
$1\frac{1}{2}$ to $2\frac{1}{2}$ in. x $\frac{1}{8}$ in.....	3.52c
$1\frac{1}{2}$ x $2\frac{3}{4}$ in. x $\frac{3}{16}$ in. and thicker.....	3.47c
1 to $1\frac{1}{4}$ in. x $\frac{3}{16}$ in.....	3.52c
1 to $1\frac{1}{4}$ in. x $\frac{1}{8}$ in.....	3.57c
$\frac{7}{8}$ x $\frac{7}{8}$ x $\frac{1}{8}$ in.....	3.62c
$\frac{3}{4}$ x $\frac{1}{8}$ in.....	3.67c
$\frac{5}{8}$ x $\frac{1}{8}$ in.....	4.47c
$\frac{1}{2}$ x $\frac{3}{32}$ in.....	5.17c

Tees:

1 x $\frac{1}{8}$ in.....	3.87c
$1\frac{1}{4}$ in. x $1\frac{1}{4}$ x $\frac{3}{16}$ in.....	3.77c
$1\frac{1}{2}$ to $2\frac{1}{2}$ x $\frac{1}{4}$ in.....	3.57c
$1\frac{1}{2}$ to $2\frac{1}{2}$ x $\frac{3}{16}$ in.....	3.57c
3 in. and larger.....	3.52c

Merchant Steel

Per lb.

Tire, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger.....	3.37c
Toe calk, $\frac{1}{2}$ x $\frac{3}{8}$ in. and larger.....	4.25c
Open-hearth spring steel.....	6.00c
Standard cast steel, base price.....	14.00c
Extra cast steel.....	18.00 to 20.00c
Special cast steel.....	23.00 to 25.00c

Tank Plates—Steel

Per lb.

$\frac{1}{4}$ in. and heavier.....	3.67c
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Sheets

Blue Annealed

Per lb.

No. 8 and $\frac{3}{16}$ in.....	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

Box Annealed—Black

Soft Steel C. R., One Pass, per lb. Wood's Refined, per lb.

Nos. 18 to 20	5.15 to 5.17c	—
Nos. 22 and 24	5.20 to 5.22c	6.55c
No. 26	5.25 to 5.27c	6.60c
No. 28	5.35 to 5.37c	6.75c
No. 30	5.55 to 5.57c	—

No. 28, 36 in. wide, 10c higher.

Wood's Keystone Hammered,
18-24 gage, 9 $\frac{1}{4}$ c; 26-28 gage, 10 $\frac{1}{4}$ c.

Galvanized

Per lb.

No. 14	5.60c
No. 16	5.75c
Nos. 18 and 20	6.00c
Nos. 22 and 24	6.15c
No. 26	6.30c
No. 27	6.45c
No. 28	6.50c
No. 30	7.00c
No. 28, 36 in. wide, 20c. higher.	—

Corrugated Roofing, Galvanized

2 $\frac{3}{4}$ in. corrugations, 10c. per 100 lb. over flat sheets.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Per lb.

Bright basic	5.25c
Annealed soft	5.25c
Galvanized annealed	6.00c
Coppered basic	6.00c
Tinned soft bessemer	7.25c

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	23c	to 24 $\frac{1}{4}$ c
High Brass Wire	23c	to 24 $\frac{1}{4}$ c
Brass Rod	21 $\frac{1}{2}$ c	to 23c
Brass Tube	33 $\frac{3}{4}$ c	to 38c

Copper Sheets

Sheet copper, hot rolled, 16 oz., 29 $\frac{1}{2}$ c. to 32c. per lb. base.	
Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.	

Tin Plates

Bright Tin	Grade	Grade	Coke—14x20	Primes	Wasters
	"AAA"	"A"			
Charcoal	Charcoal	Charcoal	80 lb. ...	\$8.30	\$8.05
14x20	14x20	14x20	90 lb. ...	8.40	8.15
			100 lb. ...	8.55	8.30
IC ..	\$11.30	\$10.05	IC ...	8.80	8.55
IX ..	13.50	12.00	IX ...	10.00	9.75
IXX ..	15.25	13.75	IXX ...	10.95	10.70
IXXX ..	17.00	15.50	IXXX ...	11.90	11.65
IXXXX ..	18.75	17.25	IXXXX ...	12.85	12.60

Terne Plates

8-Lb. Coating 14x20

100 lb.	\$8.50
IC	8.65
IX	9.65
Fire door stock	11.50

Tin

Straits pig	74c to 75c
Bar	80c to 85c
American pig, 99 per cent.....	70c to 72c

Copper

Lake Ingot	18c to 19c
Electrolytic	17 $\frac{1}{2}$ c to 18 $\frac{1}{2}$ c
Casting	17c to 18c

Spelter and Sheet Zinc

Western spelter	8 $\frac{1}{2}$ c to 9c
Sheet zinc, No. 9 base, casks.....	12c; open 13c

Lead and Solder*

American pig lead.....	6c to 6 $\frac{1}{2}$ c
Bar lead	7 $\frac{1}{2}$ c to 8 $\frac{1}{2}$ c
Solder $\frac{1}{2}$ & $\frac{1}{2}$ guaranteed.....	45c
No. 1 solder	40c
Refined solder.....	34c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	90c
Commercial grade, per lb.....	50c

Antimony

Asiatic	9 $\frac{1}{2}$ c
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	37c to 39c
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Old Metals

The market is firm. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible.....	16.75
Copper, heavy and wire.....	15.75
Copper, light and bottoms.....	13.50
Brass, heavy	10.00
Brass, light	8.00
Heavy machine composition.....	15.75
No. 1 yellow rod brass turnings.....	9.00
No. 1 red brass or composition turnings.....	12.75
Lead, heavy	4.62 $\frac{1}{2}$
Lead, tea	3.75
Zinc	4.25

